Dodge County Wind, LLC's Application to the Minnesota Public Utilities Commission for a Route Permit for a 345 kV High Voltage Transmission Line in Dodge County

MPUC Docket Number: IP6981/TL-17-308

June 29, 2018

CONTENTS

TABLES ..... **vii**

FIGURES ..... **x**

APPENDICES ..... **xi**

1.0 INTRODUCTION **17**

1.1 Statement of Ownership 17

1.2 Permittee 18

1.3 Certificate of Need 18

1.4 Route Permit Process 18

2.0 PROJECT INFORMATION **20**

2.1 Project Location 20

2.2 Project Proposal 22

2.3 Route Width 23

2.4 Associated Facilities 27

2.5 Project Schedule 28

2.6 Project Costs 28

3.0 DETAILED FACILITY DESCRIPTION & ROUTE SELECTION RATIONALE **30**

3.1 Guiding Factors for Route Selection 31

3.1.1 Easement Acquisition as a Guiding Factor 32

3.2 Road ROW Consultations with Dodge County Engineers and Minnesota Department of Transportation 33

3.3 Jackson Municipal Airport 35

3.4 Summary of Termini and Route Selection Process 35

3.5 Project Notice Area 40

3.6 Secondary Route Network and Route Adjustment Process 44

3.7 Finalization of Proposed Routes 45

3.8 ROW Description 45

3.9 Detailed Description of Proposed Routes 49

3.9.1 Route A 49

3.9.2 Route B 55

3.10 Overview of Impacts and Factors Considered 59
4.0 ENGINEERING DESIGN, CONSTRUCTION & ROW ACQUISITION 71
4.1 Transmission Line Engineering and Operational Design 71
4.1.1 Transmission Line Structures and Conductor Design 71
4.1.2 Transmission ROW 76
4.2 Identification of Existing Corridors 77
4.3 ROW Evaluation and Acquisition 79
4.4 Transmission and Substation Construction Procedures 80
4.4.1 General Construction 80
4.4.2 Construction Sequence 81
4.4.3 Surveying and Staging 81
4.4.4 Clearing 82
4.4.5 Construction in Environmentally Sensitive Areas 83
4.4.6 Access Road Construction 83
4.4.7 Transmission Construction 84
4.4.8 Collector Substation Construction 86
4.5 Restoration Procedures 87
4.6 Maintenance Procedures - Overview 87
4.6.1 DCW Maintenance Procedures 88
4.7 Electric and Magnetic Fields and Stray Voltage 89
4.7.1 Electric Fields 90
4.7.2 Magnetic Fields 93
4.7.3 Stray Voltage 95
4.8 Existing Transmission Line ROW Paralleling Considerations 95
5.0 ENVIRONMENTAL INFORMATION: ROUTE A 96
5.1 Environmental Setting 96
5.2 Land Cover 97
5.3 Soils 99
5.4 Linear Feature Sharing 100
5.5 Human Setting 101
5.5.1 Public Health and Safety 101

5.5.2 Commercial, Industrial, and Residential Land Use, Displacement 103
5.5.3 Sound 104
5.5.4 Radio, Television, Cellular Device, and GPS Interference 109
5.5.5 Aesthetics 110
5.5.6 Socioeconomic 111
5.5.7 Cultural Values 113
5.5.8 Recreation 114
5.5.9 Public Services 115
5.5.10 Transportation 117
5.5.11 Electric and Magnetic Fields 121
5.6 Land-Based Economies 123
5.6.1 Agriculture 123
5.6.2 Forestry 127
5.6.3 Tourism 127
5.6.4 Mining 128
5.7 Archaeological and Historical Resources 129
5.8 Natural Environment 131
5.8.1 Air Quality 131
5.8.2 Water Quality 134
5.8.3 Primary Water Resources 136
5.8.4 Groundwater Resources 136
5.8.5 Wetlands 137
5.8.6 Lakes, Rivers, Streams, and Ditches 141
5.8.7 Floodplains 143
5.8.8 Flora 144
5.8.9 Fauna 150
5.8.10 Rare and Unique Natural Resources 153
6.0 ENVIRONMENTAL INFORMATION: ROUTE B 161
6.1 Environmental Setting 161
6.2 Land Cover 162
6.3 Soils 163

6.4 Linear Feature Sharing 165
6.5 Human Setting 166
6.5.1 Public Health and Safety 166
6.5.2 Commercial, Industrial, and Residential Land Use, Displacement 168
6.5.3 Sound 169
6.5.4 Radio and Television Interference 170
6.5.5 Aesthetics 170
6.5.6 Socioeconomic 171
6.5.7 Cultural Values 174
6.5.8 Recreation 174
6.5.9 Public Services 175
6.5.10 Transportation 177
6.5.11 Electric and Magnetic Fields 181
6.6 Land-Based Economies 182
6.6.1 Agriculture 182
6.6.2 Forestry 185
6.6.3 Tourism 186
6.6.4 Mining 187
6.7 Archaeological and Historical Resources 187
6.8 Natural Environment 189
6.8.1 Air Quality 189
6.8.2 Water Quality 189
6.8.3 Primary Water Resources 191
6.8.4 Groundwater Resources 191
6.8.5 Wetlands 192
6.8.6 Lakes, Rivers, Streams, and Ditches 196
6.8.7 Floodplains 199
6.8.8 Flora 199
6.8.9 Fauna 205
6.8.10 Rare and Unique Natural Resources 208
7.0 ENVIRONMENTAL INFORMATION: SUBSTATION 214

7.1 Substation 214
7.1.1 Environmental Setting 214
7.1.2 Land Cover 215
7.1.3 Human Setting 215
7.1.4 Land-Based Economies 219
7.1.5 Archaeological and Historical Resources 219
7.1.6 Natural Environment 219
7.1.7 Rare and Unique Natural Features 220
7.1.8 Impacts and Mitigation 221
8.0 AGENCY INVOLVEMENT, PUBLIC PARTICIPATION AND REQUIRED PERMITS AND APPROVALS 223
8.1 Agency Contacts 223
8.2 Federal Agency Contacts 224
8.2.1 U.S. Fish and Wildlife Service 224
8.2.2 U.S. Army Corps of Engineers 224
8.3 Minnesota State Agency and LGU Contacts 225
8.3.1 Minnesota Department of Natural Resources 225
8.3.2 Minnesota Department of Transportation 225
8.3.3 Minnesota State Historic Preservation Office 226
8.3.4 Wetland Conservation Act Local Government Units 226
8.4 County Contacts 226
8.4.1 Dodge County 226
8.4.2 Olmsted County 227
8.5 City and Township Contacts 227
8.5.1 Byron 227
8.5.2 Dodge Center 227
8.5.3 Ashland Township 228
8.5.4 Cannisteo Township 228
8.5.5 Hayfield Township 228
8.5.6 Kasson 228
8.5.7 Mantorville Township 229

8.5.8 Salem Township 229
8.5.9 Kalmar Township 229
8.5.10 Ripley Township 229
8.5.11 Township Cooperative Partnership Association, Olmsted County 229
8.6 Identification of Landowners 230
8.7 Required Permits and Approvals 230
8.7.1 Federal Permits 232
8.7.2 State of Minnesota Permits 233
8.7.3 Local Permits 235
9.0 REFERENCES 236

TABLES

Table 1: Townships Along Routes 20
Table 2: Estimated Project Schedule 28
Table 3: Estimated Project Costs 29
Table 4: Summary of Impacts and Factors Considered (Minn. Stat. § 216E.03, subd. 7 and Minn. R. 7850.4100) 61
Table 5: 345 kV Structure Design Summary 72
Table 6: Summary of Length of Existing Linear Features Paralleled by Proposed Routes 77
Table 7: Estimated Electric Fields (kV/m) 92
Table 8: Estimated Magnetic Fields (mG) 94
Table 9: Land Cover Along Route A 98
Table 10: Farmland Classifications Along Route A 99
Table 11: Linear Feature Sharing for Route A 101
Table 12: Proximity of Residences to Route A Alignment 104
Table 13: Decibel Levels of Common Noise Sources 105
Table 14: MPCA State Noise Standards – Hourly A-Weighted Decibels 106
Table 15: Noise Calculations 107
Table 16: Range of Typical Construction Equipment Levels (dBA) 108
Table 17: Population Characteristics – Route A 112
Table 18: Economic Characteristics – Route A 112
Table 19: Annual Average Daily Traffic (AADT) on County, State and US Highways, Roads, and Interstates Crossed or Paralleled by Route A 118
Table 20: Agriculture Statistics for Dodge and Olmsted Counties and the State 124
Table 21: Impacts of Route A on Land Based Economies 125
Table 22: Architectural Inventory Resources Within the Route A Route Width Study Area 130
Table 23: MPCA AQI Breakpoints 132
Table 24: Air Quality Index for Rochester, MN (2012-2016) 133
Table 25: Impaired Waters Crossed by Route A 135
Table 26: Watersheds (8-digit HUC) Crossed by Route A 136
Table 27: NWI Wetlands Crossed by Route A Route Width Study Area 138
Table 28: NWI Wetlands Crossed by Route A ROW 138

Table 29: Potential Impacts of Route A on Wetlands 139
Table 30: Impacts to PWI Waters and Shallow Lakes for Route A 142
Table 31: Minnesota Designated PWI Streams and Rivers Crossed by the Route A Application Alignment 142
Table 32: Sites of Biodiversity Significance associated with Route A 147
Table 33: Summary of Estimated Natural Vegetation within Route A ROW 149
Table 34: State- and Federally-Listed Species in Dodge & Olmsted Counties, Minnesota that are within Route A Route Width Study Area 156
Table 35: Ecological and Animal Assemblages: Dodge & Olmsted Counties, Minnesota within the Route A Route Width Study Area 157
Table 36: MBS Sites of Biodiversity Significance Crossed by Route A 158
Table 37: Summary of Environmental Sites for Route A Study Area 159
Table 38: Land Cover Along Route B 163
Table 39: Farmland Classifications Along Route B 164
Table 40: Linear Feature Sharing for Route B 166
Table 41: Proximity of Residences to Route B Application Alignment 169
Table 42: Population Characteristics – Route B 172
Table 43: Economic Characteristics – Route B 173
Table 44: AADT on County, State and US Highways, Roads, and Interstates Crossed or Paralleled by Route B 178
Table 45: Agriculture Statistics for Dodge and Olmsted and the State 182
Table 46: Impacts of Route B on Land Based Economies 184
Table 47: Architectural Inventory Resources Within the Route B Route Width Study Area 188
Table 48: Impaired Waters Crossed by Route B 190
Table 49: Watersheds (8-digit HUC) Crossed by Route B 191
Table 50: NWI Wetlands Crossed by Route B Route Width Study Area 193
Table 51: NWI Wetlands Crossed by Route B ROW 193
Table 52: Impacts of Route B on Wetlands 194
Table 53: Impacts to PWI Waters and Shallow Lakes for Route B 197
Table 54: Minnesota Designated PWI Streams and Rivers Crossed by the Route B Application Alignment 198
Table 55: Sites of Biodiversity Significance associated with Route B 203

Table 56: Summary of Estimated Natural Vegetation within Route B ROW 204
Table 57: State- and Federally-Listed Species in Dodge & Olmsted Counties, Minnesota that are within Route B Route Width Study Area 210
Table 58: Ecological and Animal Assemblages: Dodge & Olmsted Counties, Minnesota within the Route B Route Width Study Area..... 211
Table 59: MCBS Sites Crossed by Route B 212
Table 60: Summary of Environmental Sites for Route B..... 212
Table 61: Structures Located within 0.5 Miles of the Project Collector Substation..... 215
Table 62: Summary of Sound Power Level Data Used in Modeling. 216
Table 63: Public Agency Inquiry Letter Contact List..... 223
Table 64: Pre-Application Meetings with LGUs and Local Interest Groups 223
Table 65: List of Potential Permits and Approvals..... 230

FIGURES

Figure 1: Project Overview Map 21
Figure 2a: Initial Route Network – North Section 37
Figure 2b: Initial Route Network – Central Section 38
Figure 2c: Initial Route Network – South Section 39
Figure 3a: Secondary Route Network – West Section 42
Figure 3b: Secondary Route Network – East Section 43
Figure 4: Illustration of 150-foot-wide ROW 46
Figure 5: Example of Anticipated Alignment Sharing Road ROW 47
Figure 6: Route A - Overview Map 50
Figure 7: Route A - Dodge County 52
Figure 8: Route A - Olmsted County 54
Figure 9: Route B - Overview Map 56
Figure 10: Route B - Dodge County 58
Figure 11: Route B - Olmsted County 60
Figure 12: Representative Single-Circuit Structure Sample Photograph 74
Figure 13: 345 kV Steel Single-Circuit Tangent 75
Figure 14: ROW Sharing 78
Figure 15: Calculated Electric Fields (kV/m) for the Proposed 345 Kilovolt Single Circuit Tangent Delta Configuration Generation Tie Line (3.28 feet above ground) 91
Figure 16: Calculated Electric Fields (kV/m) for the Proposed 345 Kilovolt Single Circuit Tangent Vertical Configuration Generation tie line (3.28 feet above ground) 92
Figure 17: Calculated Magnetic Flux density (mG) for the Proposed 345 Kilovolt Single Circuit Tangent Delta Configuration Generation tie line (3.28 feet above ground) 93
Figure 18: Calculated Magnetic Flux density (mG) for the Proposed 345 Kilovolt Single Circuit Tangent Vertical Configuration Generation tie line (3.28 feet above ground) 94

APPENDICES

Appendix A: 90-Day Pre-Application Letters to Local Units of Government and Affidavits of Mailing
Appendix B: County-Level Maps
Appendix C: Detailed Aerial Maps
Appendix D: Diagram and Photo of Interconnection into Byron Substation
Appendix E: Road Right of Way Drawings
Appendix F: Impact Tables for Route A, Route B, and Project Collector Substation
Appendix G: Technical Drawings of Proposed Structures
Appendix H: Environmental Feature Maps
Appendix I: Maps of Airports, Private Air Strips, Heliports, and Navigational Aids
Appendix J: Obstruction Evaluation and Airspace Analysis
Appendix K: Agency Correspondence
Appendix L: List of Landowners

ACRONYM/TERM	DEFINITION
AADT	Annual Average Daily Traffic
Applicant or Blazing Star	Blazing Star Wind Farm, LLC
Biennial Report	2015 Biennial Transmission Projects Report
CN	Certificate of Need
Commission	Minnesota Public Utilities Commission
CPP	Clean Power Plan
Exemption Request	Request for Exemption from Certain Certificate of Need Application Content Requirements
FAA	Federal Aviation Administration
Geronimo	Geronimo Energy
IRP	Integrated Resource Plan
ITC	Investment Tax Credit
LEFG	Large Electric Generating Facility
kW	Kilowatt
kWh	Kilowatt hour
LHVTL	Large High Voltage Transmission Line
LiDAR	Light Range Detecting Unit
LWECS	Large Wind Energy Conversion System
Minn. R.	Minnesota Rules
Minn. Stat.	Minnesota Statutes
MISO	Midcontinent Independent System Operator
MN/DOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MVP	Multi Value Project
MW	Megawatt
O&M	Operations and Maintenance
PPA	Power Purchase Agreement
Project	Blazing Star Wind Farm
PTC	Production Tax Credit
RES	Renewable Energy Standard
SCADA	Supervisory Control and Data Acquisition
SoDAR	Sonic Range Detecting Unit

Minnesota Rule	Required Information	Application Section(s)
Minn. Stat. § 216E.03 (a) – Project Notice	At least 90 days before filing an application with the commission, the applicant shall provide notice to each local unit of government within which a route may be proposed. The notice must describe the proposed project and the opportunity for a preapplication consultation meeting with local units of government as provided in subdivision 3b.	Appendix A
Minn. Stat. § 216E.03 (b) – Project Notice and Consultations	Within 30 days of receiving a project notice, local units of government may request the applicant to hold a consultation meeting with local units of government. Upon receiving notice from a local unit of government requesting a preapplication consultation meeting, the applicant shall arrange the meeting at a location chosen by the local units of government. A single public meeting for which each local government unit requesting a meeting is given notice satisfies the meeting requirement of this subdivision.	Appendix A, Appendix K
Minn. R. 7850.1900, Subp. 2	**Route Permit for high voltage transmission line**	
A.	A statement of proposed ownership of the facility at the time of filing the application and after commercial operation	1.0, 1.1
B.	The precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated	1.0, 1.1
C.	At least two proposed routes for the proposed high voltage transmission line and identification of the applicant's preferred route and the reasons for the preference	2.0
D.	A description of the proposed high voltage transmission line and all associated facilities including the size and type of the high voltage transmission line	2.1 – 2.4

Minnesota Rule	Required Information	Application Section(s)
E.	The environmental information required under subp. 3	5.0, 6.0
F.	Identification of land uses and environmental conditions along the proposed routes	5.6, 6.6
G.	The names of each owner whose property is within any of the proposed routes for the high voltage transmission line	Appendix L
H.	United States Geological Survey topographical maps or other maps acceptable to the Commission showing the entire length of the high voltage transmission line on all proposed routes	Appendix B, Appendix C
I.	Identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share the right-of-way (ROW) with the proposed line	3.8, Appendix E
J.	The engineering and operational design concepts for the proposed high voltage transmission line, including information on the electric and magnetic fields of the transmission line	4.0
K.	Cost analysis of each route, including the costs of constructing, operating, and maintaining the high voltage transmission line that are dependent on design and route	2.6
L.	A description of possible design options to accommodate expansion of the high voltage transmission line in the future	4.1.2
M.	The procedures and practices proposed for the acquisition and restoration of the ROW, construction, and maintenance of the high voltage transmission line	4.4 – 4.6

Minnesota Rule	Required Information	Application Section(s)
N.	A listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line	8.7
O.	A copy of the Certificate of Need or the certified high voltage transmission line list containing the proposed high voltage transmission line or documentation that an application for a Certificate of Need has been submitted or is not required	1.3
Minn. R. 7850.1900, Subp. 3	**Environmental Information**	
A.	A description of the environmental setting for each site or route	5.1, 6.1, 7.1.1
B.	A description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services	5.5, 6.5, 7.1.3
C.	A description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining	5.6, 6.6, 7.1.4
D.	A description of the effects of the facility on archaeological and historic resources	5.7, 6.7, 7.1.5
E.	A description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna	5.8, 6.8, 7.1.6
F.	A description of the effects of the facility on rare and unique natural resources	5.8.10, 6.8.10, 7.1.7
G.	Identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route	3.9, 5.5, 5.8, 6.5, 6.8, 7.1.4, 7.1.6

Minnesota Rule	Required Information	Application Section(s)
H.	A description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigation measures	5.0, 6.0, 7.0

1.0 INTRODUCTION

Dodge County Wind, LLC (DCW or Applicant) submits this Application to the Minnesota Public Utilities Commission (Commission) for a Route Permit to construct and operate a 345 kilovolt (kV) transmission line (herein after referred to as a "generation tie line") and associated facilities (the Project) to deliver energy from the approximately 170 megawatt (MW) DCW Large Wind Energy Conversion System (LWECS) to the electric grid.[1] The length of the Project will be approximately 23 miles (Route A is approximately 21 miles in length and Route B is approximately 26 miles).

The transmission routes presented in this Application are those the Applicant has identified through a comprehensive review, involving more than a year of study and analysis. In arriving at the route options presented, DCW undertook analysis of engineering options, environmental conditions, and socioeconomic considerations with the objective of minimizing impacts on the environment and affected landowners.

1.1 Statement of Ownership

The Project will be owned by DCW, which is a wholly-owned indirect subsidiary of NextEra Energy Resources, LLC (NEER). As member of the NEER family of companies, DCW benefits from the project development and technical expertise of its affiliated companies. For example, DCW's NEER affiliates own, operate, and maintain approximately 800 substations and 76,700 miles of transmission and distribution lines, allowing DCW to draw from its NEER affiliates' capabilities in transmission project development and ownership.

[1] DCW is simultaneous submitting a separate Application to obtain a site permit for the DCW LWECS project in Docket No. WS-17-307.

1.2 Permittee

The authorized representatives for the Applicant are:

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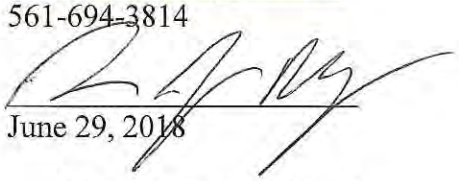


June 29, 2018

1.3 Certificate of Need

Pursuant to Minnesota Statutes (Minn. Stat.) Section 216B.243, a Certificate of Need (CON) is required for a large energy facility as it is defined in Minn. Stat. Section 216B.2421. Minn. Stat. § 216B.2421, Subd. 2(1) defines a "large energy facility" for which a CON is required as "any electric power generating plant or combination of plants at a single site with a combined capacity of 50,000 kilowatts or more and transmission lines directly associated with the plant that are necessary to interconnect the plant to the transmission system." Contemporaneous with the submission of this Route Application, DCW is submitting a CON application for a LWECS, which includes as an associated facility this Application's 345 kV generation tie line need to interconnected the LWECS to the transmission grid. The CON application will be filed in Docket No. CN-17-306.

As explained in the CON application, DCW has executed a 30-year power purchase agreement with the Minnesota Municipal Power Agency (MMPA) for the entire output of the LWECS. The output of the Project will assist MMPA in exceeding the Renewable Energy Standard established in Minnesota Statutes § 216B.1691.

1.4 Route Permit Process

This Application is filed under the full permitting process set forth in Minn. Stat. Section 216E.03 and Minnesota Rules (Minn. R.) 7850.1700 to 7850.2700 and 7850.4000 to 7850.4400,

which, among other things, requires DCW to provide at least two proposed transmission routes.[2] The transmission route is the location of a transmission line between the two end points, with a variable width of up to 1.25 miles.[3] In this proceeding, the Commission staff, the Department of Commerce, Energy and Environmental Review and Analysis (EERA) staff, and an administrative law judge (ALJ) will oversee evaluation and review of the proposed routes and the gathering of input from agencies, local units of government (LGU), and the public. After the Commission finds the Application complete, notice of an environmental impact statement (EIS) scoping meeting will be provided to stakeholders in the Project area and those on the Project Contact List. Interested parties may sign up for the Project Contact List by contacting the Commission at docketing.puc@state.mn.us or 651.201.2204 (1.800.657.3782).

At this scoping meeting, and throughout a comment period after the scoping meeting, EERA will gather information from stakeholders on potential impacts and mitigation measures that should be evaluated in the EIS. EERA will recommend to the Commission the impacts and mitigation measures, including routes and route alternatives to be evaluated in the EIS. The Commission will then issue a "Scoping Decision" that identifies the impacts and mitigation measures to be evaluated in the EIS. Thereafter, EERA will issue a Draft EIS and meetings will be held in the Project area to gather comments on the content of the Draft EIS. After these meetings, EERA will issue a Final EIS.

The public will also be invited to make comments on the Project at these hearings before an ALJ. After the hearings, the ALJ will provide a period during which stakeholders can submit written comments on the Project. Additionally, the ALJ will receive briefs from the Applicants and other parties to the proceeding. The ALJ will review this Application, the EIS, briefs, and comments received during the public hearings, and, following a comment period, will prepare findings of fact, conclusions of law, and recommendations for the Commission. During an open meeting, the Commission will deliberate and make a decision as to the route for the Project, using the criteria set forth in Minn. Stat. Section 216E.03, subdivision 7(b), and Minn. R. 7850.4100 to guide its decision.

Over ninety days prior to submitting this Application, DCW provided written notice to LGUs and offered to schedule a pre-application consultation meeting, per the requirements of Minn. Stat. Section 216E.03, subds. 3a and 3b. The notices were sent to these entities by DCW on April 20, 2017, and subsequently updated on January 22, 2018. The initial and updated notices are provided in **Appendix A (90-Day Pre-Application Letters to Local Units of Government and Affidavits of Mailing)**.

[2] Minn. Stat. § 216E.03, subd. 3; Minn. R. 7850.1900, Subp. 2(C).

[3] Minn. Stat. § 216E.01, subd. 8; see also Minn. R. 7850.1000, Subp. 16.

2.0 PROJECT INFORMATION

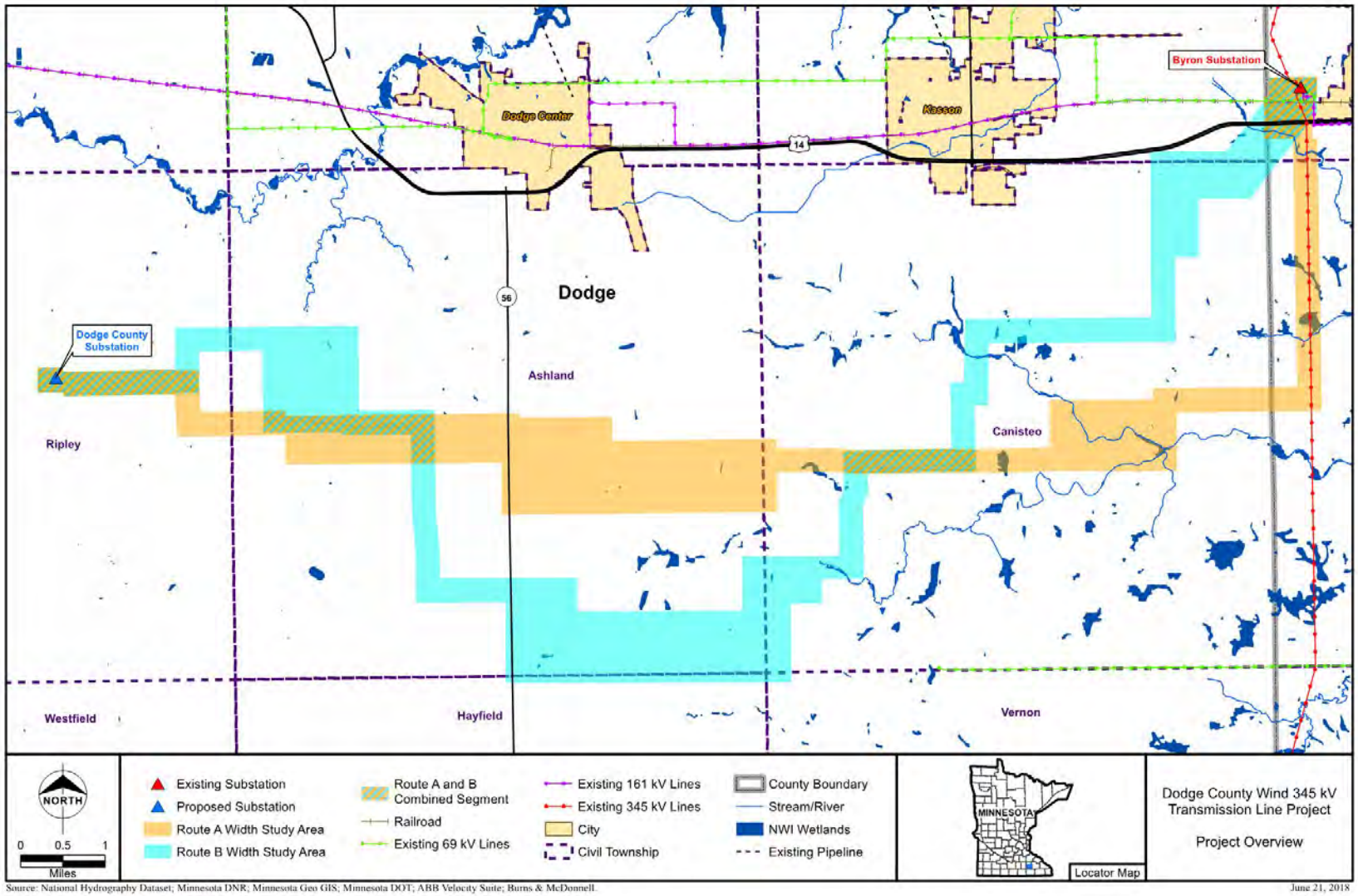
2.1 Project Location

The proposed routes for the Project are located in the eastern portion of Dodge County and the western portion of Olmsted County in southeastern Minnesota. Route A would be within the townships of Ripley, Ashland, and Canisteo in Dodge County; and, within the townships of Salem and Kalmar, and the City of Byron in Olmsted County. Route B would be within the townships of Ripley, Ashland, Hayfield, Vernon, Canisteo, and Mantorville in Dodge County; and, within the townships of Salem and Kalmar, and the City of Byron in Olmsted County. **Figure 1** provides an overview of the two route alignments. **Table 1** provides the township names and section numbers crossed by each route. Approximately 0.2 mile of both Route A and Route B extends through of the City of Byron. Please see **Appendix B (County-Level Maps)** for additional detailed overview maps.

Table 1: Townships Along Routes

County	Route A		Route B	
	Township/City	Sections	Township	Sections
Dodge	Ripley	13, 14, 15, 24	Ripley	12, 13, 14, 15
	Ashland	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28	Ashland	7, 8, 16, 17, 18, 19, 20, 21, 25, 27, 28, 29, 32, 33, 34, 35, 36
			Hayfield	1, 2, 3, 4
			Vernon	6
	Canisteo	13, 14, 15, 19, 20, 21, 22, 23, 30	Canisteo	1, 2, 9, 10, 11, 12, 14, 15, 16, 19, 20, 21, 29, 30, 31
	Mantorville	36	Mantorville	35, 36
Olmsted	Salem	16, 17, 18	Salem	6
	Kalmar	31	Kalmar	31
	City of Byron	31	City of Byron	31

Figure 1: Project Overview Map



2.2 Project Proposal

The Project includes a new 345 kV generation tie line extending from a new substation in the western portion of Dodge County, Minnesota, to the existing Southern Minnesota Municipal Power Agency (SMMPA) Byron Substation in western Olmsted County, near the City of Byron, Minnesota. The Project will be connected to a new approximately 170 MW LWECS in Dodge County, Minnesota. The new LWECS is a renewable energy project intended to assist MMPA in achieving and surpassing its renewable energy requirements. DCW has identified two routes between the two Project endpoints, Route A and Route B (the Proposed Routes in this application).

The length of the Project will be approximately 23 miles (Route A is approximately 21 miles in length and Route B is approximately 26 miles). Route A would parallel approximately 3.2 miles of the existing Byron to Pleasant Valley 345 kV transmission line through Salem and Kalmar townships in Olmsted County, which extends from the southeast portion of the study area to the Byron Substation. For a visual representation of this segment, see **Appendix C (Detailed Aerial Maps)**, pages AO-1 through AO-3. Route A would not share right of way (ROW) with this existing transmission line; instead, the proposed 150-foot ROW for the Project would be adjacent to the existing ROW for the Byron to Pleasant Valley line. There would be no double-circuiting with the existing 345 kV line, nor any underbuild with existing distribution lines proposed in this location. Combined with the existing 150-foot easement of the existing transmission line, the Project would result in a new 300-foot-wide transmission corridor paralleling the existing line for the 3.2 miles in Salem and Kalmar Townships in Olmsted County. Route B would involve paralleling a short segment (approximately 0.1 mile) of the existing Byron to Pleasant Valley transmission line near the Byron Substation (*see* **Appendix C (Detailed Aerial Maps**), page BO-1).

There are four areas within the Project Study Area where Route A and Route B use the same alignment or segments. These combined Route A and Route B segments were developed as a based on voluntary landowner participation in the Project, and have been designed to avoid known sensitive environmental resources and features. The combined segments allow for additional opportunities for interconnections between the two routes, as they allow a portion of Route B to be combined with a different portion of Route A (or vice versa) to create a new hybrid route that utilizes a portion of each route.

If Route A is selected by the Commission, the majority of the new 345 kV generation tie line would extend through primarily agricultural lands in Dodge and Olmsted Counties, utilizing a mix of parcel lines, field lines, and landowner-preferred locations for the anticipated alignment. Route A offers a shorter, more direct route across the Project Study Area (when compared to Route B) and includes the paralleling of a portion of the Project with an existing 345 kV transmission line. Route A would enter the existing Byron Substation from the south after crossing over U.S. Highway 14.

Route B also crosses through primarily agricultural land and utilizes a combination of parcel and field lines, as well as land-owner specified locations through the Project Study Area. Route B includes a greater percentage of length parallel to roads within the Project Study Area when compared to Route A, avoids crossing through the McNeilus windfarm (*see* **Appendix C (Detailed Aerial Maps)**, page BD-3), and also enters the Byron Substation from the south.

2.3 Route Width

Minn. Stat. Chapter 216E directs the Commission to locate transmission lines in a way that ". . . minimize[s] adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring that electric energy needs are met and fulfilled in an orderly and timely fashion." Minn. Stat. § 216E.02, subd. 1. A route may have a variable width of up to 1.25 miles, within which the transmission line, its ROW, and associated facilities can be located. Minn. Stat. § 216E.01, subd. 8. As explained below, the Applicant worked diligently to appropriately size the variable widths, so as not to use the entire 1.25 mile width for the entirety of the Project. The flexibility and variability in the widths was developed with the understanding that the Applicant does not possess the authority to use eminent domain.

The widths and routes were developed to be wide enough to provide flexibility for the permittee to work with landowners to address concerns and to address engineering issues that may arise after a Route Permit is issued. DCW also developed an "anticipated alignment," or centerline for the proposed transmission line, contained within each alternative route width that minimizes overall potential impacts to the factors discussed in **Section 5** and **Section 6**. DCW anticipates that the proposed Route A and Route B ROW depicted in **Appendix C (Detailed Aerial Maps)** will generally conform to the anticipated alignment proposed for the Project. Should additional modifications to the anticipated alignment be requested by landowners, or should additional sensitive resources be identified during subsequent field survey efforts, DCW will locate alignment modifications within the designated route width so as to have comparable overall impacts relative to the factors listed in Minn. R. part 7850.4100.

DCW will undertake more detailed engineering and survey work along the anticipated alignment to determine additional resources and factors that could influence the location of the anticipated alignment. In addition, DCW will continue to work with landowners and agencies with permitting responsibilities to determine any additional modifications to the anticipated alignment. As noted above, any modifications proposed by landowners and/or agencies will be assessed against comparable impacts of the modification in relation to the factors listed in Minn. R. part 7850.4100. Only after considering the above inputs will DCW propose an exact centerline and pole placement (Final Alignment). Once DCW establishes the Final Alignment and structure placement, proposed construction drawings are provided to the Commission in a Plan and Profile compliance filing at least 30 days prior to ROW preparation for construction. From this filing, the Commission can confirm that the permittee's plans are consistent with the Route Permit. Additional modifications to the Final Alignment may become necessary as

information is obtained during additional survey work, detailed engineering, and further consultation with landowners. Any additional modifications would be submitted by DCW to the Commission through additional Plan and Profile compliance filings. Should DCW decide to make any significant changes to its Plan and Profile or the specifications and drawings after submission to the Commission, DCW will notify the Commission at least five days before implementing the changes. No changes will be made by DCW that would be in violation of any of the terms of the Route Permit issued for the Project.

Consistent with the Commission's recent practice to identify an anticipated alignment in its Route Permit decisions, DCW developed alignments for both proposed Route A and Route B that minimize the overall potential impacts of the Project upon the factors identified in Minn. R. part 7850.4100. The alignment set forth in the Application may be modified through the review process prior to a permit decision and may require additional modifications after a Route Permit is issued due to limitations inherent in identifying an alignment absent detailed survey, site review, engineering work, and design. The alignment developed for purpose of minimizing the potential impacts of each route is available on the detailed maps in **Appendix C (Detailed Aerial Maps).**

DCW proposes Route A and Route B to have a width of 1,500 feet for the majority of their length. DCW identified multiple routing options within each route width, such as those that run along field lines, roads, and property lines that could be used as part of a new transmission line corridor. In several areas within the Project Study Area, a wider route width is requested in order to increase flexibility in obtaining landowner permissions for the Project, as DCW's entire route will require voluntary land rights (*i.e.*, no use of eminent domain).

In addition to the standard route width of 1,500 feet, both Route A and Route B include two additional route width categories that were developed specifically for areas where additional flexibility was needed due to the inability to secure voluntary easements, or where voluntary easements were in negotiation at the time of this Application's submittal. Additional route widths proposed for both Route A and Route B include 3,000 feet and 4,500 feet widths, depending on land acquisition constraints in specific sections of the proposed routes.

Route A

For Route A, DCW requests a wider route width in the following five areas, going from west to east across the Project Notice Area:

- DCW requests a route width of 3,000 feet, starting from approximately 0.7 mile west of 170th Avenue and extending east 2.8 miles to a point just east (0.1 mile) of Highway 56 (*see* **Appendix C**, page AD-1). The wider route width is requested in this area to provide routing flexibility due to the inability to secure voluntary easements for parcels on the north side of 670th Street. The expanded route width in

this area also provides a larger area in which to locate alternative alignments across parcels that have either already granted the Project an easement or on adjacent parcels with a greater probability of securing voluntary easements.

- DCW requests a route width of 4,500 feet from a location just west (0.7 mile) of Highway 56, extending east for approximately 1.2 miles in portions of Sections 21, 22, 23, 26, 27, and 28 of Ashland Township (*see* **Appendix C**, page AD-2 and AD-3). This wider route width is requested to provide routing flexibility due to uncertainty about obtaining a voluntary easement for the parcels east of Highway 56. The wider route width requested for this area also provides additional space in which to optimize the route through the McNeilus windfarm during detailed design.

- DCW requests a route width of 3,000 feet from a point 0.15 mile east of 200th Avenue, extending eastward for approximately 2 miles across portions of Sections 23, 24, 25, and 26 in Ashland Township and Sections 19 and 30 in Canisteo Township (*see* **Appendix C**, page AD-3 and AD-4). This wider route width is requested to provide routing flexibility due to uncertainty about obtaining voluntary easements just north of 680th Street. The additional route width requested in this location will expand the potential area to acquire an easement from adjacent parcels located to the north of this area.

- DCW requests a route width of 3,000 feet for Route A in portions of Sections 14, 15, 22, and 23 in Canisteo Township. The expanded route width in this area would extend from just west (0.6 mile) of 260th Avenue, extending eastward for 1.5 miles (*see* **Appendix C**, page AD-5). A wider route width is requested in this area to provide routing flexibility due to uncertainty in obtaining voluntary easements along 670th Street and 260th Avenue. Additionally, DCW is currently in negotiations with additional adjacent parcels to the south of 670th Street in this area; the additional requested route width in this area encompasses these parcels and provides for an additional area in which to locate the Project, should voluntary easements be secured.

- DCW requests a route width of 3,000 feet for the area surrounding the Byron Substation in Section 31 of Kalmar Township in Olmsted County and Section 36 in Mantorville Township in Dodge County. This section of Route A (a portion of which shares a segment with Route B near the Byron Substation) extends from a point just south of U.S. Highway 14, continuing north for approximately 0.5 mile, encompassing 280th Street to the east. After crossing the existing railroad and 4th Street NW, the route width shifts east approximately 290 feet (*see* **Appendix C**, page AO-3). The wider route width in this area is requested as a result of multiple factors. First, the expanded route width provides additional flexibility in obtaining voluntary

easements along portions of 270th Avenue and U.S. Highway 14 where land access has not been secured. Second, the expanded width in this area provides additional routing and design flexibility for the Project as it enters the Byron Substation, as well as provides additional space for potential adjustments to substation components as a result of this Project.

Route B

For Route B, DCW requests a wider route width in the following three areas:

- DCW requests an expanded route width of 4,500 feet from a point 0.5 mile east of 160th Avenue, extending eastward for approximately 0.8 mile to a location just (0.1 mile) east of 170th Street across portions of Sections 7, 8, 17, 18, 19, and 20 of Ashland Township in Dodge County (*see* **Appendix C**, page BD-2). This wider route width is requested to provide routing flexibility due to uncertainty in obtaining voluntary easements west of 170th Avenue and immediately south of 660th Street. The additional route width requested in this area will expand the area to include parcels that have either already granted the Project an easement or have a greater probability of securing voluntary easements.

- DCW requests a route width of 3,000 feet in portions of Sections 25, 27, 28, 33, 34, 35, and 36 in Ashland Township; Sections 1, 2, 3, and 4 in Hayfield Township; Section 6 in Vernon Township; and Sections 30 and 31 in Canisteo Township (*see* **Appendix C**, pages BD-4 and BD-5). The expanded route width in this area would extend just past the intersection of Highway 56 and 690th Street, continuing south for 1.2 miles until just past (less than 0.1 mile) 700th Street. From here, the expanded route width would extend eastward for 3.3 miles (with a slight jog 0.5 mile south, shown on page BD-5 of **Appendix C**) to a point just 0.3 mile east of 220th Avenue. The expanded route width continues north from this location for approximately 1.3 miles until just after (0.3 mile) 690th Street. The area extends east from this location approximately 0.6 mile until the end of the expanded route width area. The additional route width is requested in this area due to multiple locations along Route B where DCW has been unable to secure voluntary easements north of 700th Street, in between Highway 56 and 220th Avenue. The requested route width in this location provides extra space along 700th Street which encompasses additional parcels still under negotiation for an easement with DCW.

- DCW requests a route width of 3,000 feet in Sections 1, 2, 11, and 12 in Canisteo Township and Sections 35 and 36 of Mantorville Township in Dodge County; and, Section 6 of Salem Township and Section 31 in Kalmar Township in Olmsted County (*see* **Appendix C**, BD-8, BD-9, and BO-1). The expanded route width area starts at a

point 0.4 mile north of 665th Street, extending northward for approximately 1.1 miles. From here, the expanded route width area extends in a northeast direction (*see* **Appendix C**, page BD-9) for 1.6 miles until reaching the Byron Substation. A wider route width is requested in this area to provide routing flexibility due to uncertainty in obtaining voluntary easements along portions of 270th Avenue and U.S. Highway 14. Additionally, as with Route A in this location, the expanded route width mirrors the requested additional Route A route width near the Byron Substation in order to provide additional space for potential adjustments to substation components, as well as additional routing and design flexibility for the Project as it enters the Byron Substation.

2.4 Associated Facilities

The associated terminal facilities for the Project include the construction of the new DCW Collector Substation, including the high-side (345 kV) of the new DCW Collector Substation.

2.4.1 DCW Collector Substation (New)

DCW proposes to construct a new collector substation approximately seven miles southwest of the city of Dodge Center, Minnesota (*see* **Appendix B (County-Level Maps)** and **Appendix D (Diagram and Photo of Interconnection into Byron Substation)**). DCW has executed an option with a landowner to purchase up to ten acres where it proposes to construct the new DCW Collector Substation. The DCW Collector Substation graveled footprint is anticipated to be no larger than one acre, but more detailed design engineering will confirm the size based on equipment needs. The collector substation will step up from the 34.5 kV collector system (which is part of the Site Permit) to 345 kV. For purposes of the generation tie line, the substation will include 345 kV busses, transformers, circuit breakers, reactive equipment, steel structures, a control building, metering units, and air break disconnect switches. Typical utility-grade ceramic/porcelain or composite/polymer insulators designed and constructed in accordance with ANSI C29 will be utilized on the systems.

2.4.2 Byron Substation (existing)

The Project will interconnect to the SMMPA Byron Substation. There are currently four existing lines that terminate at the Byron substation: a 161 kV line and a 345 kV line owned by Northern States Power, and a 69 kV line and a 161 kV line owned by SMMPA. The proposed DCW generation tie line approaches Byron from the south and will need to cross the existing transmission lines owned by Northern States Power. DCW will continue to coordinate with Northern States Power to develop crossing details.

The anticipated upgrades at the Byron Substation will include a new take-off structure, breaker, bus work, and ancillary equipment to fit the requirements of the system impact study. **Appendix**

D (Diagram and Photo of Interconnection into Byron Substation) provides a view of how the DCW generation tie line will interconnect to the Byron Substation.

2.5 Project Schedule

Table 2: Estimated Project Schedule

Activity	Estimated Completion
Certificate of Need Order	**May 2019**
Route Permit Order	**May 2019**
Site Permit Order	**May 2019**
Environmental Permits Received	**Feb 2019**
Other Permits/Approvals Received	**Feb 2019**
Land Acquisition	**Feb 2019**
Commencement	**July-Dec 2019**
In-Service Date	**Dec 2019**

2.6 Project Costs

Estimated costs for the Project include the costs of installation, land acquisition, and procurement of equipment and services, as well as other miscellaneous costs. Currently, costs are considered ± 35% due to the early stage of the Project and its size. The cost information in **Table 3** below is an approximation based on assumptions regarding structure type, line length, and land cost.

Table 3: Estimated Project Costs

Project Facility	Route A (22 mi.) (millions)	Route B (26 mi.) (millions)
Dodge County 345kV Gen-tie	$33	$39
Dodge County 345kV Collection Substation	$6	$6
345kV Byron Substation Expansion	$1.5	$1.5
TOTAL	**$40.5**	**$46.5**

Operations and Maintenance

The primary cost associated with the operation and maintenance (O&M) of a transmission line is the cost of inspections, which DCW plans to perform at least semi-annually using drone technology. This technology allows DCW to inspect lines without the intrusiveness of a helicopter fly-over. DCW will coordinate with the Federal Aviation Administration (FAA) to ensure all necessary approvals and clearances have been obtained prior to usage of the drones. Annual O&M costs for transmission lines in Minnesota and the surrounding states vary depending upon the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the transmission line. Based on the costs of required tasks for O&M a 345 kV transmission line, including tower maintenance, vegetation removal, and inspections, and other recent cost estimates for similar transmission lines, O&M costs for the Project will likely be approximately $900 per mile annually.

Substations also require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters, DCW procedures, North American Reliability Corporation (NERC) Reliability Standard requirements, and the National Electric Safety Code (NESC). Transformers, circuit breakers, control buildings, batteries, relay equipment, and other substation equipment need to be serviced periodically to maintain operability. The substation's fenced area will also be kept free of vegetation, with proper drainage maintained.

3.0 DETAILED FACILITY DESCRIPTION & ROUTE SELECTION RATIONALE

DCW has used a multi-step route development and evaluation process for the Project. Activities in the development of proposed routes for the Project included consideration of regulatory requirements and factors listed in Minn. R. part 7850.4100 and Minn. Stat. Section 216E.03; specifically: (i) establishment of a Project Notice Area in which to begin analyzing prospective route and termini for the Project; (ii) review of information and associated on-site surveys to identify the characteristics of the Project Notice Area; and (iii) a broad public and agency outreach effort. DCW has also developed a Geographic Information System (GIS) database for the Project with resource layers obtained from federal, state, and local agencies. These steps are discussed in detail in the following sections.

Prior to the establishment of the Project Notice Area, DCW also investigated alternative termini locations and associated alternative route segments for the Project. These alternative termini locations and segments were investigated to determine whether they met the purpose and need for the Project. As part of this process, DCW evaluated the comparative potential impacts each alternative location and corresponding routes would have on potential sensitive resources between the alternative termini points. This original area under consideration was developed prior to the issuance of the 90-day LGU notice for the DCW Project and was used as an initial starting point from which to narrow the area of study to the proposed Routes A and B presented in this application.

DCW conducted outreach activities with Project stakeholders associated with the original routing area under consideration, including Dodge and Olmsted Counties, townships, agencies, landowners, and LGUs to introduce the Project and acquire a greater understanding of potential local concerns. DCW's initial outreach effort sought to involve all LGUs within the potential Project footprint in order to best incorporate early feedback into transmission line alignment design considerations. When necessary, DCW conducted follow-up meetings with affected stakeholders.[4] These outreach activities resulted in adjustments and modifications to the alternative route segments that are presented in this Application. DCW continued investigations into these alternative route segments for possible constraints, sensitive resources, and potential routing opportunities, including those that respond to Minnesota statutes and rules for designating sites and routes (*e.g.*, Minn. Stat. Section 216E.03, subdivision 7, and Minn. R. 7850.1900, Subpart 3, 7850.4000, and 7850.4100). This effort resulted in the design of the proposed Routes A and B and in the refinement of the final termination points for the Project (i.e., Dodge County collection substation and the Byron Substation). It also allowed DCW to revise and reduce the Project Notice Area, ultimately resulting in the two proposed routes

[4] In recognition of the fact that the routing process is an iterative process, Project representatives will continue to meet with appropriate LGUs to present submitted route alignments, and to notify LGUs of upcoming comment periods.

presented in this Application. Additional detail on the process of selecting these alternative routes for the Project is provided below.

3.1 Guiding Factors for Route Selection

In developing and assessing the alternative route segments during all stages of this Project, DCW was guided by the criteria set forth in Minn. Stat. Section 216E.03, subdivision 7, and Minn. R. part 7850.4100.

Minn. Stat. Section 216E.03, subdivision 7(a) provides that the Commission's route permit determinations must be guided by the state's goals to conserve resources, minimize environmental impacts, minimize human settlement and other land use conflicts, and ensure the state's electric energy security through efficient, cost-effective power supply and electric transmission infrastructure. Subdivision 7(e) of the same section requires the Commission to make specific findings that it has considered locating a new transmission line on an existing transmission line route or existing ROW and, to the extent those are not used for the route, the Commission must state the reasons.

In addition to the statutory criteria mentioned above, Minnesota Statues Section 216E.03 and Minn. R. part 7850.4100 provide that when determining whether to issue a Route Permit for a high voltage transmission line, the Commission shall consider the following relevant factors:

A. Effects on human settlement, including, but not limited to: displacement, noise, aesthetics, cultural values, recreation, and public services;
B. Effects on public health and safety;
C. Effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining;
D. Effects on archaeological and historic resources;
E. Effects on the natural environment, including effects on air and water quality resources and flora and fauna;
F. Effects on rare and unique natural resources;
G. Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity;
H. Use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries;
I. Use of existing transportation, pipeline, and electrical transmission systems or rights-of-way;
J. Electrical system reliability;
K. Costs of constructing, operating, and maintaining the facility which are dependent on design and route;
L. Adverse human and natural environmental effects which cannot be avoided; and

M. Irreversible and irretrievable commitments of resources.

Additionally, as a result of the outreach activities for the Project, DCW added a list of guiding factors for the development of alternative routes for the Project. These additional guiding factors were based on discussions with LGUs, agency and public officials, and landowners within the Project Notice Area. These discussions resulted in a more site-specific list of factors that helped guide the development of the proposed routes in this Application. The following additional criteria were used to further assess and refine alternative segments between the two Project termini within the Project Notice Area:

- Avoidance of local Wildlife Management Areas (WMA) or Game Refuge areas including the McMartin WMA, the Bud Jensen WMA, and the Claremont Game Refuge;
- Minimize alternative route segments within Dodge County 100-year floodplain areas;
- Avoidance of local mapped sinkholes;
- Minimize use of alternative route segments near the North Fork of Salem Creek;
- Maximize distance from or span local archaeological and historic resource sites;
- Maximize crossing of pasture, grassland, or rangeland rather than cropland;
- Maximize distance from radio towers and McNeilus Wind Farm turbines;
- Maximize distance from residences;
- Avoid terrain that makes construction and maintenance of a transmission line more difficult;
- Minimize multiple crossings of highways in short distances;
- Minimize repeated crossings of waterways;
- Minimize woodland clearing; and
- Attempt to cross cropland at narrow areas where it could be spanned or the number of structures in fields could be minimized.

3.1.1 Easement Acquisition as a Guiding Factor

As previously discussed in **Section 2.3**, DCW does not possess the authority to use eminent domain for this Project. As such, DCW has been working to acquire voluntary easements for both Route A and Route B since the development of the final route network. DCW has participated in consultations with approximately 240 individual landowners across the Project Notice Area since February 2017. Building on these landowner meetings, DCW has secured (at the time of this Application's submittal) approximately 97% of the total necessary private easements for Route A, and approximately 95% of the total necessary private easements for Route B.

DCW will continue to attempt to secure all remaining land underlying both Route A and B with voluntary easements. DCW also proposes to utilize road ROW for the Project in areas where

voluntary easements cannot be secured. DCW proposes to locate the Project within road ROW when practicable, consistent with Minn. Stat. Section 216E.03, subdivision 7(e) and the Commission's implementing rules that call upon the Commission to consider the utilization of existing road, railroad, and transmission ROW when selecting new transmission line routes. Although road ROW use is currently proposed for both Route A and Route B, DCW is continuing to work with landowners surrounding these areas of proposed road ROW to secure additional optionality for the final alignment and centerline.

3.2 Road ROW Consultations with Dodge County Engineers and Minnesota Department of Transportation

As discussed previously, the use of road ROW for the Project was initiated in consideration of the difficulty of securing voluntary private easements in certain locations within the Route Width Study Area. As part of this process, DCW initiated outreach activities with the Minnesota Department of Transportation (MN/DOT) and Dodge County for those areas in which the Project proposed to use road ROW to determine both state and county policies, regulations, and preferences regarding the use of road ROW for the Project. No road ROW use is proposed for either Route A or B in Olmsted County.

DCW initiated contact with Dodge County to discuss the use of road ROW in January 2017. DCW then conducted multiple in-person meetings and conference calls with the Dodge County Roads Engineer as well as the Dodge County Commission and Dodge County Highway Department staff. DCW conducted over 15 in-person meetings and conference calls with Dodge County staff regarding the Project, inquiring as to the use of road ROW in Dodge County. Dodge County staff provided guidance to DCW on potential issues and concerns with the use of road ROW, such as the need to coordinate with affected townships (such as the development of individual Township Agreements for road ROW use), identify necessary culvert replacements, assess drainage structures within the road ROW, and DCW's responsibility to update bridge load ratings, where necessary. Dodge County staff also indicated that DCW would be required to provide a Development Agreement, Road Use and Repair Agreement, and a Drainage Agreement for the Project, once detailed engineering and design is completed. Additionally, during these consultations, DCW also learned of new fiber optic and natural gas line construction that is currently being planned for construction within the road ROW in Cannisteo and Ashland townships next year. DCW plans to reach out to these utilities to begin coordination for civil designs and crossing/encroachment agreements, where applicable. Dodge County Engineering staff indicated that the Project could be located within Dodge County road ROW, provided the appropriate PUC approvals are issued.

Additionally, Dodge County staff indicated that once the PUC issues a Route Permit for the Project, Dodge County can only issue an easement for those areas of road ROW for which they hold fee-title. DCW will continue to work with Dodge County engineers to determine the appropriate location for the Project in Dodge County road ROW, as well as to secure the

necessary agreements and approvals noted above. As part of these ongoing consultations, DCW has agreed to prepare preliminary Dodge County Utility ROW permit applications to work with the county in good faith to identify any preliminary issues with any proposed segments located in Dodge County road ROW. Additionally, DCW intends to discuss with MN/DOT and affected counties and townships the issue of financial responsibility for future pole relocations within the road ROW resulting from the presence of existing or planned infrastructure improvements. With respect to the townships in Dodge County, DCW has also consulted with Ripley, Ashland, and Canisteo townships on specific segments of road ROW in each respective township. As of the date of filing the Application, DCW has not received an objection from these townships to the use of road ROW for the Project.

DCW also conducted meetings with MN/DOT staff regarding the use of road ROW on state highways within the Route Width Study Area for each proposed route. DCW proposed to parallel and cross State Highway 56 and U.S. Highway 14. As detailed engineering has not been completed at this time, MN/DOT staff provided general guidance on the use of state highway ROW for the Project. MN/DOT policy on utility accommodation of highway ROW states that it is in the public interest that utility facilities be able to be located in highway, local road, and street ROW when:

> …such use and occupancy of the right of way does not interfere with the free and safe flow of traffic, does not impair the highway or its protected visual quality, does not conflict with any provisions of federal state, or local law, rule, or regulation, or does not unreasonably increase the difficulty or future cost of highway construction or maintenance. (MN/DOT, 2018)

MN/DOT also indicated that DCW would need to adhere to the accommodation policy and would require direct consultation with District 6 staff prior to any approvals being issued. MN/DOT staff also noted that they would prefer placing existing distribution lines in an under-build configuration on the new transmission line to minimize poles within the ROW and that a separate crossing permit will be required for the Project to cross U.S. Highway 14 near the Project interconnect to Byron Substation. Additionally, MN/DOT indicated that it would not approve their ROW permit prior to the PUC issuance of a Route Permit. DCW and MN/DOT also plan to revisit the proposed design of the Project near state highways once pole locations are finalized, likely in the fall of 2018. DCW would then submit an Application for Utility Accommodation on Trunk Highway Right of Way (Form 2525) to MN/DOT to obtain a permit for the transmission line, which is required before starting work to install or maintain utilities within trunk highway ROW. MN/DOT may consider future highway characteristics and usage in their review of the Project during review of the ROW permit. After the permit is issued, MN/DOT may require adjustment or relocation of permitting facilities for highway maintenance and construction. MN/DOT policy states that "all costs related to constructing, maintaining, altering, and relocated the facility is the responsibility of the utility owner, unless state law otherwise provides." (MN/DOT, 2018).

Depending on the final route selected for the Project, DCW will continue to work with Dodge County and MN/DOT to place structures in their ROW. The use of this road ROW is consistent with Minn. Stat. Section 216E.03, subdivision 7(e), as well as the Commission's implementing rules that direct the Commission to consider utilizing existing road, railroad, and transmission ROW when selecting new transmission line routes.

3.3 Jackson Municipal Airport

DCW also met with representatives from Jackson Municipal Airport to discuss potential routing conflicts due to future airport expansion plans. More information on the feedback received is available in **Section 9.1.3**.

3.4 Summary of Termini and Route Selection Process

DCW, in consultation with MMPA, began assessing the alternative substation locations to determine the viability of each location for the Project. In addition to the new DCW Collector Substation in southwestern Dodge County, three alternative substation sites were analyzed to determine if they could support the Project. The three alternative substation locations included: (1) the North Rochester Substation, just north of Pine Island, Minnesota, in Goodhue County; (2) a new potential substation located approximately 6 miles north of Byron on the border of Dodge and Olmsted Counties; and (3) SMMPA's Byron Substation, located on the west side of Byron, Minnesota, in Olmsted County.

NEER's Transmission Services group modelled potential connection points for the proposed collector substation and identified the North Rochester Substation as the closest point of interconnect (POI) that would avoid the potential for significant network upgrades. Alternative route segments were then developed to the Rochester Substation to determine the viability of this location for the Project. A total of five alternative routes were developed and assessed to determine the potential impacts to sensitive resources present along these alternative routes. Due to the additional length from the proposed DCW Collector Substation, the five alternative routes to the North Rochester Substation encountered substantially more sensitive resources between the two termini locations (**Figures 2a, 2b, and 2c** display the complete initial route network to each alternative substation under consideration). Additionally, DCW re-assessed the potential economic impact on the Project with an updated transmission model and determined that, due to the location and use of the North Rochester Substation, it would be more cost effective to identify and assess different termini for the Project. As a result of the additional number of sensitive resources in proximity to the alternative routes developed for the North Rochester Substation location and the related Project cost analysis, the North Rochester Substation (and the five associated alternative routes) were dropped from further consideration for the Project.

DCW continued to assess alternative termini locations and segments into 2017, meeting with additional local stakeholders, including the Minnesota Department of Natural Resources

(MNDNR), Minnesota State Historic Preservation Office (SHPO), Dodge County Public Works and Planning and Zoning departments, and potentially affected landowners to identify possible constraints associated with other termini locations. NEER Transmission Services reassessed the available connection points to the proposed DCW Collector Substation and targeted a potential POI approximately one mile north of Byron, Minnesota. However, additional consultations with MMPA regarding the target POI location resulted in the identification of another preferred terminus location for the Project, which is located five miles north of the initial tap point identified by NEER Transmission Services (approximately six miles north of Byron). The approximate location of this base case alternative substation location is shown in **Figure 2b**, below. DCW then began evaluation of this terminus location and developed three alternative routes connecting the proposed DCW Collector Substation with this potential POI location. As with all the alternative termini locations, this second terminus and associated alternative routes were assessed for the presence of sensitive resource and routing constraints (*i.e.*, those enumerated in Minn. Stat. Section 216E.03, subd. 7 and Minn. R. part 7850.4100). The three alternative route locations that were developed to this alternate substation location were generally located west of Dodge Center, Minnesota, and continued northward, until extending east near New Haven Township to the second alternate POI, approximately six miles north of Byron.

Figure 2a: Initial Route Network – North Section

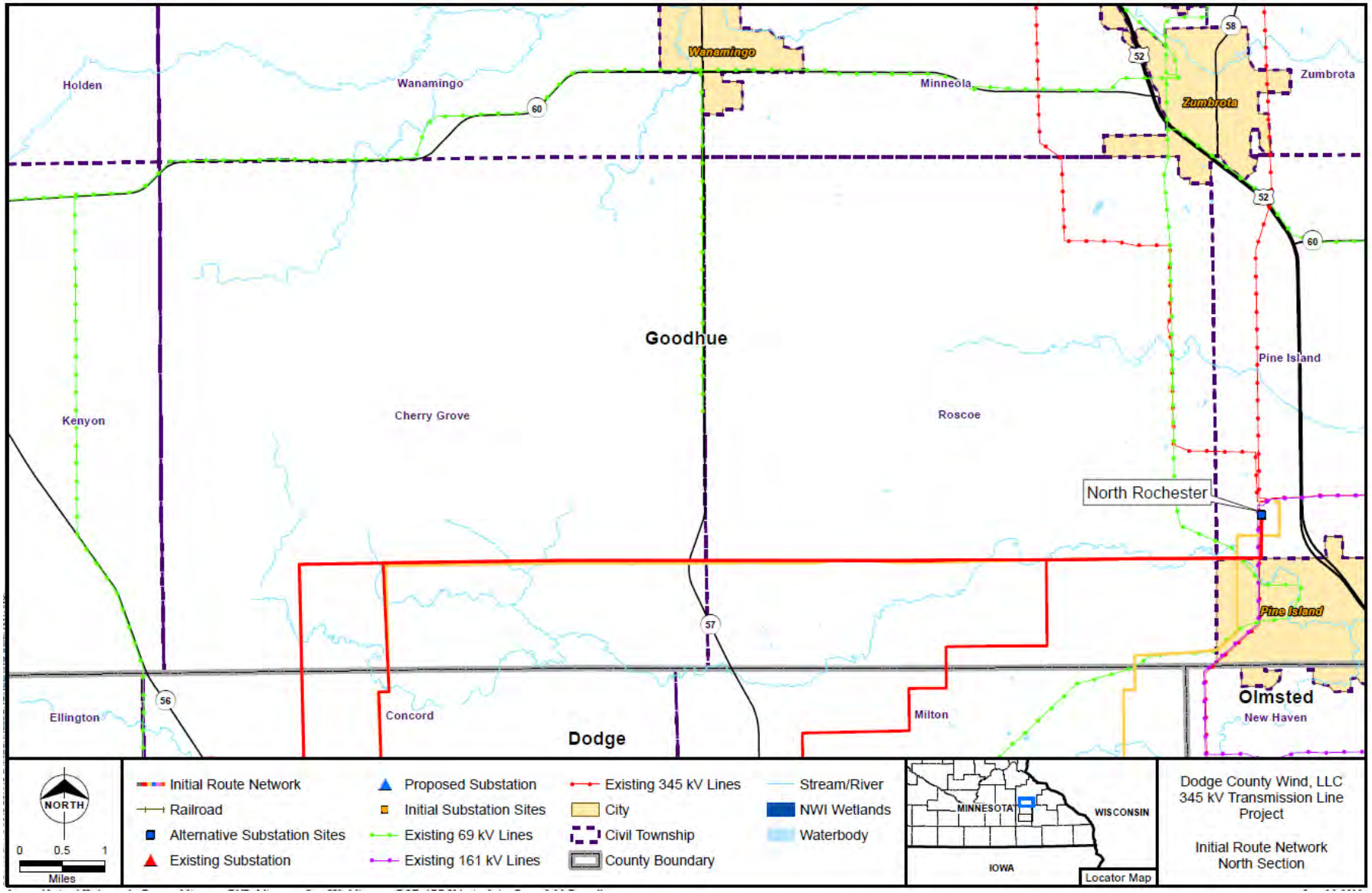


Figure 2b: Initial Route Network – Central Section

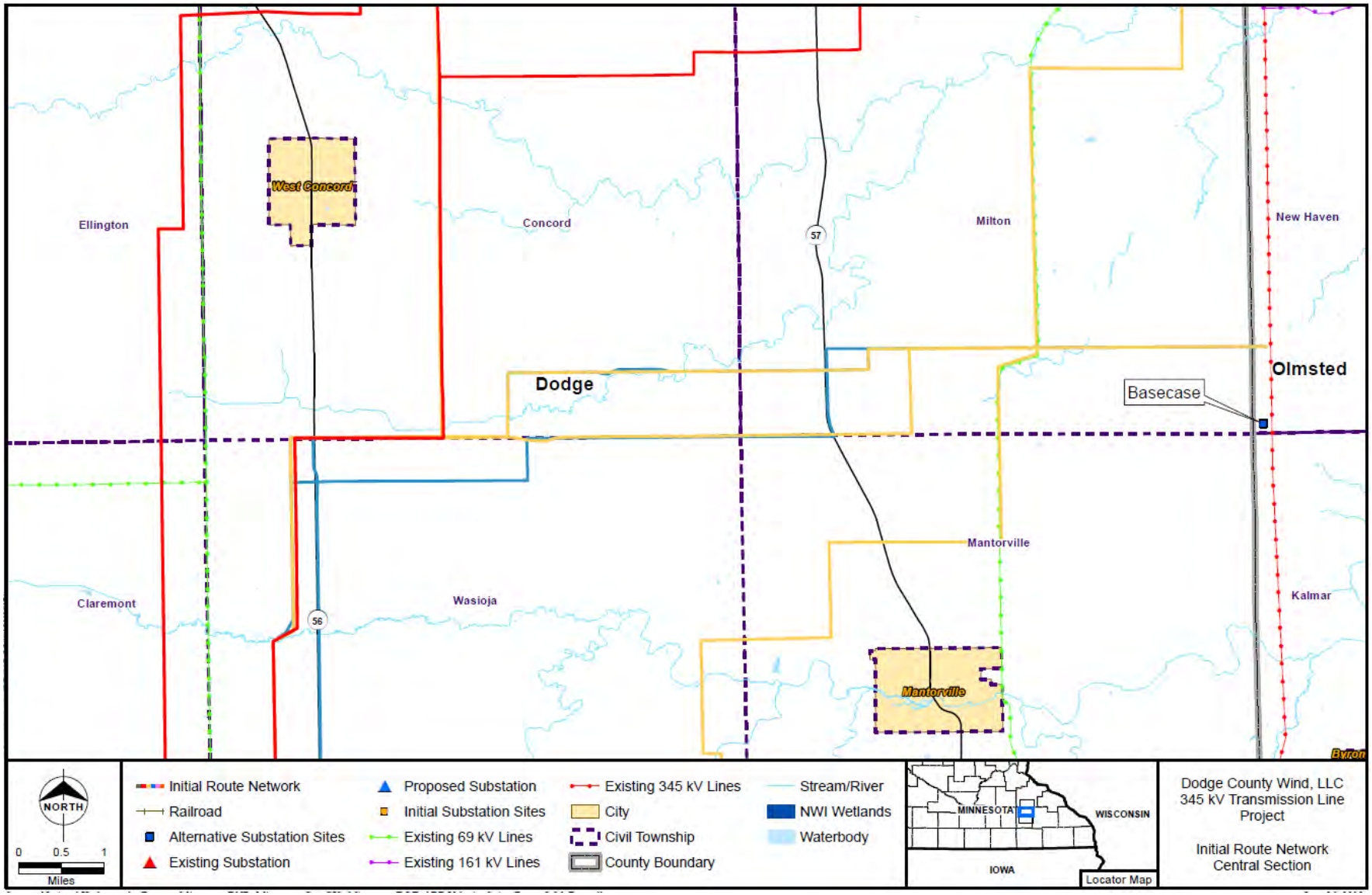
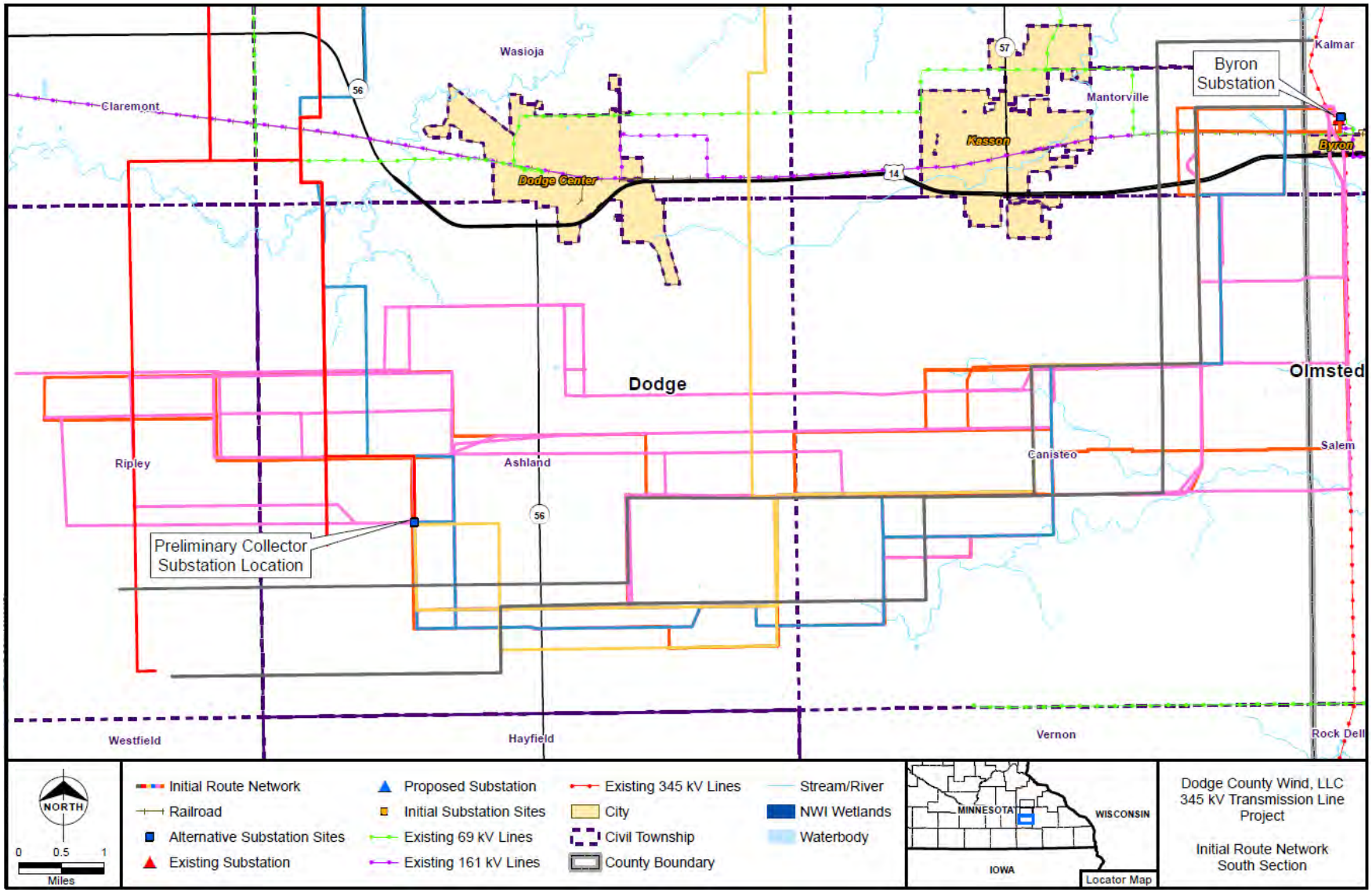


Figure 2c: Initial Route Network – South Section



DCW continued to assess the potential routing constraints and cost implications to the Project of utilizing the second alternate POI. In April 2017, ongoing discussions between DCW and MMPA resulted in an agreement for the Project to utilize the Byron Substation. DCW began further assessing the Byron Substation as a potential terminus for the Project and developed approximately six preliminary alternative routes between the DCW Collector Substation and the Byron Substation. The combination of the reduced distance between these termini locations, associated reduction in the number and extent of sensitive resources, and the results of the revised Project cost analysis, favored the Byron Substation as the preferred POI for the Project. Additional discussion of the technical merits on the selection of the 345 kV voltage level and Byron Substation as the POI to the transmission grid is provided in DCW's CON Application.

Following the identification of the Byron Substation as the preferred POI for the Project and subsequent development of alternative routes between this POI and the proposed DCW Collector Substation, DCW determined an appropriate Project Notice Area for the Project in which to assess and refine the alternative routes in between these termini points.

3.5 Project Notice Area

An initial Project Notice Area was developed to encompass the preliminary alternative routes and to further identify the potential stakeholders to the Project within this area (*see* the "Initial Project Notice Area" in **Figure 3a** and **3b**). Additionally, this initial Project Notice Area further refined the area in which DCW would gather and assess information regarding sensitive environmental resources and current land uses. The initial Project Notice Area also helped identify Project stakeholders and assisted in the removal of extraneous areas of study. The initial Project Notice Area for the Dodge County Wind Project covered an area of approximately 89 square miles and was approximately 3 to 5 miles wide and 20 miles long.

The initial Project Notice Area was developed to allow for an adequate number of distinct route alternatives for the Project without adding unnecessary areas that did not support reasonable route alternatives. The Area provided for a range of routing options to develop the two proposed routes for this Project. Notification letters were sent to LGUs within this initial Project Notice Area on April 20, 2017.

DCW continued to assess potential route alternatives within the initial Project Notice Area in late 2017 and into early 2018. Multiple route alternatives were developed between the new proposed DCW Collector Substation and the Bryon Substation during this time. Alternative segments were added or removed based on information obtained from landowners and public and agency officials, with consideration given to the potential impact on the routing criteria enumerated in Minn. Stat. Section 216E.03, subd. 7 and Minn. R. part 7850.4100.

As the Project developed, DCW continued to assess both the area necessary for the proposed DCW Collector Substation as well as the availability of voluntary easements along each alternative route. DCW also performed assessments and reconnaissance efforts in the field

throughout the initial Project Notice Area in early 2017. As a result of these activities, two key factors influenced the decision to expand the boundaries of the initial Project Notice Area. First, as a result of continued assessment of the DCW LWECS and the need for potential adjustments to the proposed DCW Collector Substation location, the notice area around the collector station was expanded to allow for additional flexibility in connecting the LWECS with the transmission line and to provide additional areas to identify voluntary easements. Second, due to the challenge of securing voluntary easements along the most southern route alternatives, additional alternative segments were generated south of these alternatives, expanding the necessary area for notification. As a result of these two factors, DCW expanded the notification area and mailed a revised and final Project Notice Area letter to LGUs within the Project Notice Area (*see* **Figure 3a** and **3b**) on January 22, 2018.

Figure 3a: Secondary Route Network – West Section

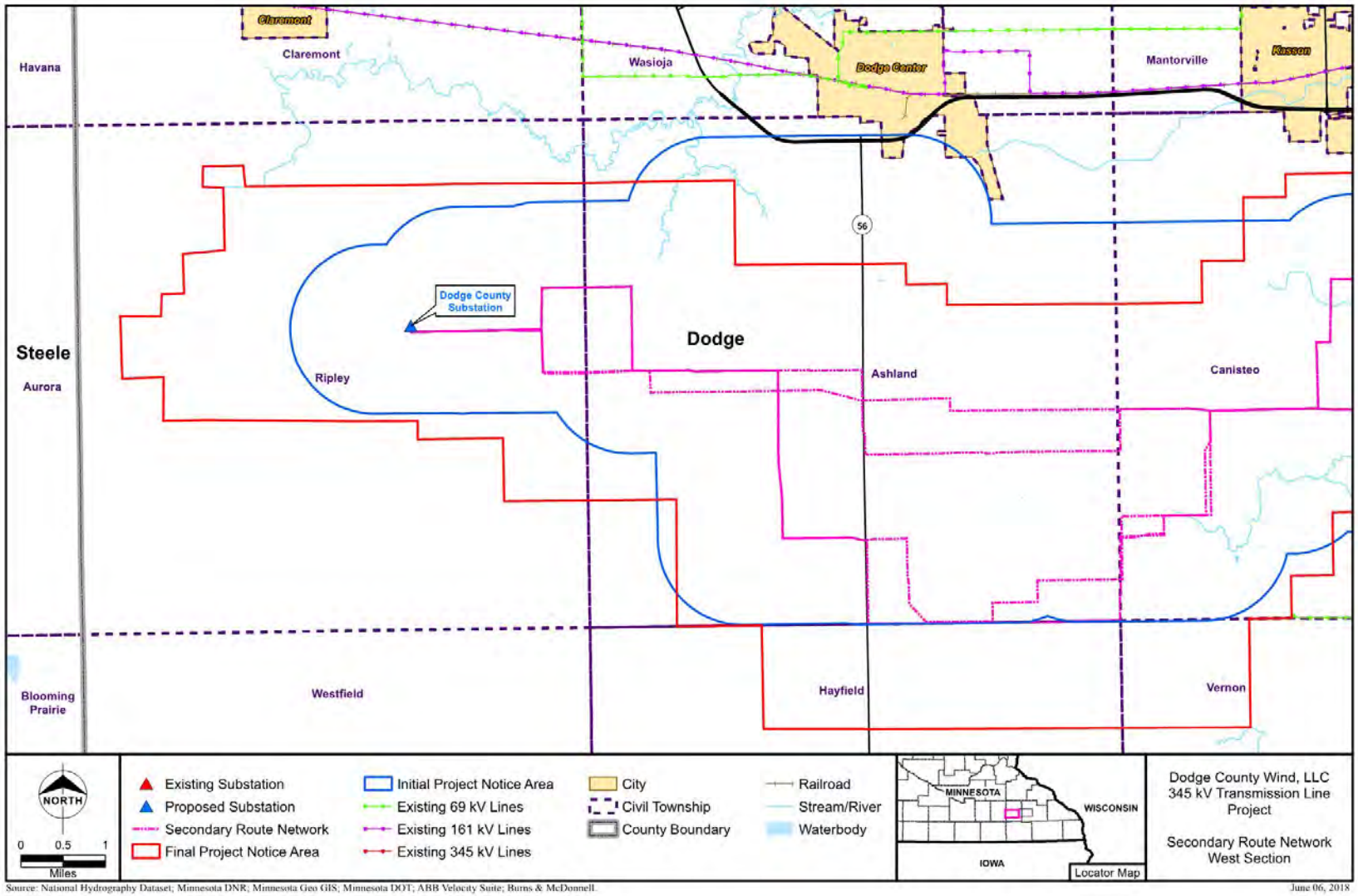
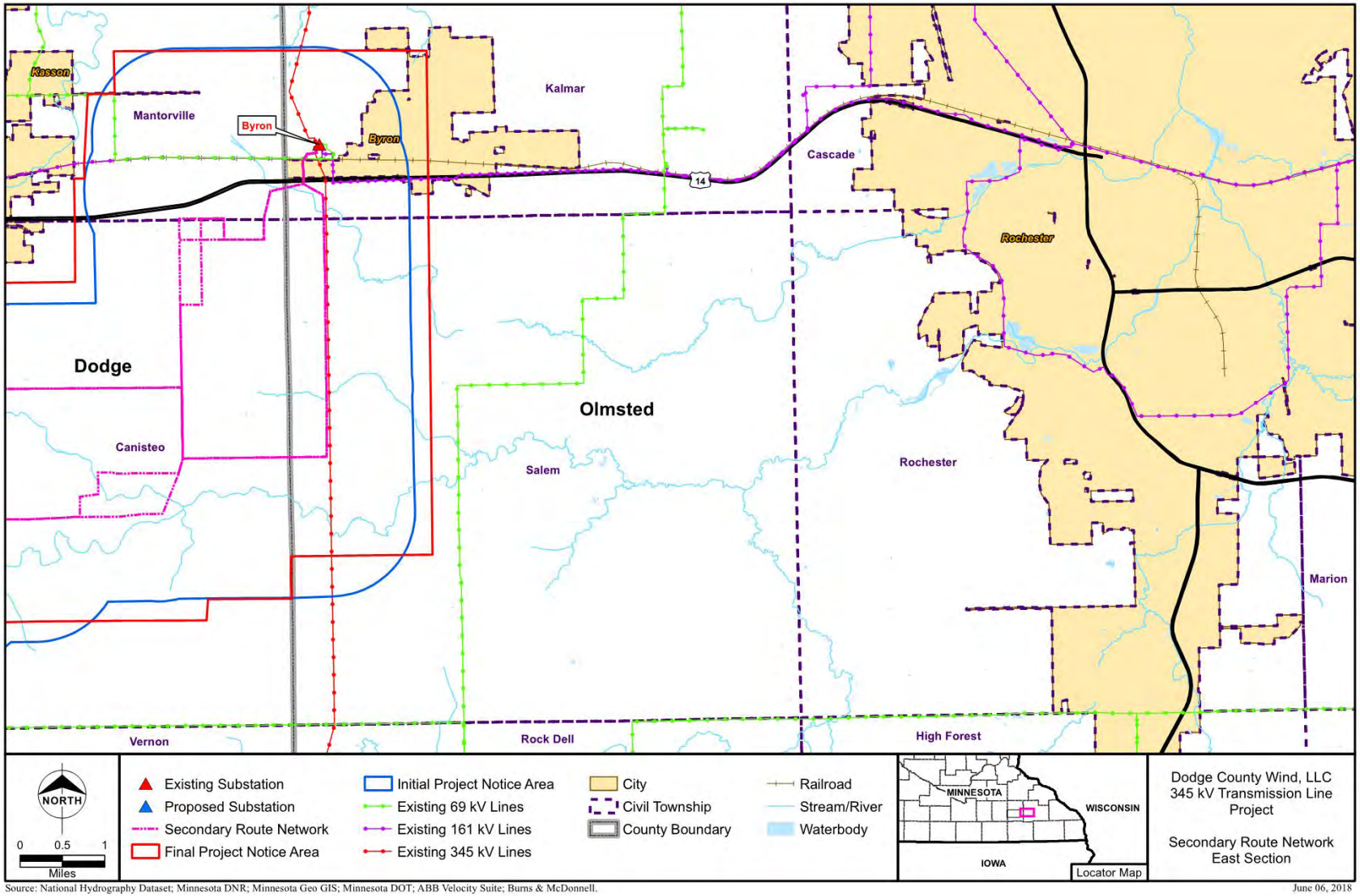


Figure 3b: Secondary Route Network – East Section



Source: National Hydrography Dataset; Minnesota DNR; Minnesota Geo GIS; Minnesota DOT; ABB Velocity Suite; Burns & McDonnell.

June 06, 2018

3.6 Secondary Route Network and Route Adjustment Process

Following the development of the final Project Notice Area, DCW continued to develop alternative routes between the DCW Collector Substation and Byron Substation. In addition to the primary alternative routes, connectors were identified to provide areas near routing constraints or areas where voluntary easements could not be obtained. These connector segments provided additional options to both avoid these constraints and provide for additional options to move back and forth between Route A and Route B. The alternative routes and connector segments developed in the secondary route network required extensive consultation with landowners throughout the Project Notice Area to determine the availability of voluntary parcels that would be interested in participating in the Project.

As previously indicated, securing voluntary easements along alternative routes is a key factor that drives the location and make-up of alternative routes across the Project Notice Area. Throughout the land acquisition process, DCW continually assessed new alternative segments and routes proposed by landowners. The development of alternative routes in the secondary route network, and their location across the Project Notice Area, was heavily influenced by the availability of willing landowners to support the Project. In addition, each new alternative segment or adjustment to an existing segment was continually assessed according to the routing criteria in Minn. Stat. Section 216E.03, subd. 7 and Minn. R. part 7850.4100. Throughout the development of, and revisions to, the secondary route network, the following iterative process was developed to review route adjustments resulting from landowners' preferences regarding the location of the Project on their land:

1. DCW meets with landowner to discuss the potential of locating the Project on their land or requests an adjustment to an existing route segment on their parcel.
2. DCW reviews the new or adjusted route location with Project engineers to determine if the proposed or requested route segment is constructible for the Project and consistent with DCW's construction and maintenance requirements regarding safe construction and operation of the line.
3. If deemed constructible, the new or adjusted route location is reviewed for consistency with the routing criteria in Minn. Stat. Section 216E.03, subd. 7 and Minn. R. part 7850.4100.
4. If found acceptable and consistent with Minnesota routing criteria, the new or adjusted route location is assessed against additional information gained from LGUs, public or agency officials, or other information regarding potential routing constraints or opportunities in that specific area.
5. DCW re-visits the landowner to present the new or adjusted route, explaining any limitations on the location of that segment in relation to the constructability and environmental and/or routing constraint review.

6. If acceptable to the landowner, the new or adjusted route or segment is carried forward for additional analysis and potential selection as one of the two proposed routes in this Application.
7. If not deemed acceptable by the landowner, the above process begins again with another potential route or segment location on the landowner's parcel, or should no agreement be reached, additional options for potential route segments are investigated by the DCW team in that area.

Using the above process for all the alternative route segments in the secondary route network, DCW revised, eliminated, or created new alternative route segments with the goal of developing two distinct constructible routes across the Project Notice Area that were consistent with the routing criteria in Minn. Stat. Section 216E.03, subd. 7 and Minn. R. part 7850.4100 and that reflected the preferences of the landowners who provided a voluntary easement for the Project.

3.7 Finalization of Proposed Routes

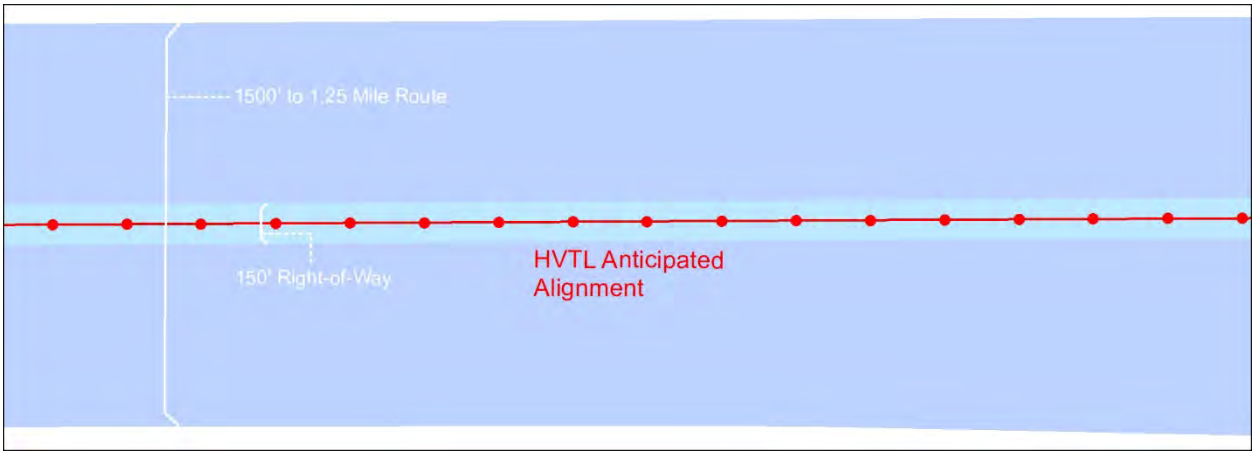
From the original area under consideration for the alternative termini, DCW employed a detailed multi-step process to continually refine the route network for the Project. In the review and assessment of alternative termini locations, and the development and analysis of alternative route segments to those locations, DCW considered: (i) the routing criteria in Minn. Stat. Section 216E.03, subd. 7 and Minn. R. part 7850.4100; (ii) additional routing constraint information provided by public or agency officials' and (iii) landowner preferences. Through this stakeholder-involved process, DCW designed two distinct routes for the Project.

Route A was identified as the "Preferred Route" due to a number of factors that are discussed in detail throughout this Application. For example, Route A is shorter than Route B and will impact less prime farmland, cultivated lands, floodplains, and wetlands. Route A also parallels existing HVTL ROW for a greater distance than Route B. Route A also has fewer homes within 500 feet of its alignment.

3.8 ROW Description

DCW anticipates using varying ROW widths for both Route A and Route B depending on the location of the route. For the majority of Route A and Route B, DCW proposes to use a 150-foot-wide ROW for the Project. In these areas, transmission line structures would be placed in the center of the ROW, with 75 feet of ROW on each side of the structure (*see* **Figure 4**). A 150-foot total ROW is proposed for approximately 64 percent of Route A and approximately 57 percent of Route B. **Figure 4** provides an illustration of a 150-foot ROW and the anticipated alignment within the ROW. As discussed in **Section 2.3**, the proposed route widths for the Project range from a minimum of 1,500 feet to a maximum of 1.25 miles wide.

Figure 4: Illustration of 150-foot-wide ROW



For portions of the transmission line outside existing road ROW, DCW proposes that transmission structures be located near, and, also, parallel to property division lines or field lines, as reasonably feasible. In areas where placing transmission structures close to property division lines is not feasible, DCW will work with landowners to determine where to place structures in a way that minimizes impacts to the property. For structures that require guy wires, DCW will work with landowners to determine anchor locations that minimize impacts to land use. For those areas where easements have been secured, DCW has worked extensively with landowners whose parcels are crossed by the Project to determine the preferred location of the transmission line on their properties.

DCW has also investigated and evaluated the use of road ROW in certain locations. As discussed in **Section 3.2**, DCW investigated the use of both state and county road ROW with MN/DOT and Dodge County engineers, highway staff, and county commissioners. DCW also met with representatives from the affected townships where road ROW use is currently proposed. DCW will work with Dodge County and MN/DOT to place structures in their ROW when the final route for the Project has been selected. The use of this road ROW is consistent with Minn. Stat. Section 216E.03, subdivision 7(e), as well as the Commission's implementing rules that direct the Commission to consider utilizing existing road, railroad, and transmission ROW when selecting new transmission line routes.

Portions of the transmission line that are proposed to be placed within existing road ROW will not require new public or private ROW. These portions of the line will have a ROW width equal to the prescribed road ROW width in which they are proposed. Thus, the Project will be placed wholly within the prescribed road ROW of a specific section of roadway (*see* **Figure 5**). For example, if the road ROW is a total of 100 feet in width, the Project will be placed within this 100 feet, located on the outside edge of the road ROW, as far from the roadway as practicable. Structures proposed to be located within the road ROW would be configured to have the arms on the road-side of the structure.

Figure 5: Example of Anticipated Alignment Sharing Road ROW

Of the current designs being proposed for Route A and Route B, blowout would occur over the roadway for all road ROW widths, with the exception of the 150-foot road ROW being proposed for MN 56. For this portion of Route A and Route B (and as currently designed), the blowout would occur up to the roadway edge, but would not extend into the roadway. Additionally, at a rest condition, all of the current designs proposed for Route A and Route B would not allow the conductors to overhang the roadway, with the exception of portions of road ROW with a 66-foot width. Once a route is selected by the Commission, DCW will continue to work with MN/DOT and Dodge County to coordinate on the final design of the Project within their respective road ROW, as well as on all applicable safety offset and construction requirements necessary for these portions of the line. Additional detail regarding the specific road ROW design for portions of Route A and Route B is provided below. Additionally, **Appendix E (ROW Sketches)** provides a cross-section of each instance of road ROW width proposed for use by the Project. Each cross section provides a visual illustration of the Project within the specific road ROW width proposed for that given route segment, including designs where existing distribution lines would be underbuilt on the 345 kV structures.[5]

Route A is approximately 21.4 miles long and is located within road ROW for 7.8 miles (36%). The total Route A ROW is approximately 333.5 acres, with approximately 80.45 acres (24%) of the total ROW for Route A located within existing road ROW. Route B is approximately 26.3

[5] Due to similar widths, a separate cross-section was not developed for the portion of Route B that utilizes a 70-foot wide road ROW. This design is represented by Sketch 1, which depicts a 66-foot side ROW proposed for use by the Project. Additionally, the cross-sections include only one sketch per unique road ROW width; for example, if a similar road ROW width was proposed for use in different locations by both routes, a separate cross section was not provided for each Route, but rather represented by a single cross-section that could apply to both areas of similar road ROW width. Additionally, due to the short distance being proposed, a separate design was not provided for the small portion of 670th Street where a 93-foot road ROW is proposed. This design would be similar to the 100-foot wide cross-sections.

miles long and is located within road ROW for 11.2 miles (43%). Route B would require approximately 400.6 acres of total ROW, with approximately 119.4 acres (30%) of this ROW within existing road ROW.

Route A uses road ROW for approximately 7.8 miles (see **Appendix E**, Sketches 1-4, for illustrations of road ROW use for Route A). The road ROW used by Route A is along the following roads:

- Where Route A extends along 670th Street, the ROW would be primarily 66 to 70 feet wide within road ROW (*see* **Appendix E**, Sketch 1), including portions proposed for distribution underbuild (*see* **Appendix E**, Sketch 2). A short distance (approximately 970 feet) along 670th Street just east of 260th Avenue would be 93 feet wide when within road ROW.
- Where Route A extends along MN 56, the ROW would be 150 feet wide (*see* **Appendix E**, Sketch 3), including portions proposed for distribution underbuild (*see* **Appendix E**, Sketch 4).
- Where Route A extends along 680th Street, the ROW would be 66 to 100 feet wide when within road ROW (*see* **Appendix E**, Sketch 1). No distribution underbuild is proposed for 680th Street for areas within a 66-foot road ROW.

Route B uses road ROW for approximately 11.2 miles (see **Appendix E**, Sketches 1, 2, 6, and 7, for illustrations of road ROW use for Route B). The road ROW used by Route B is along the following roads:

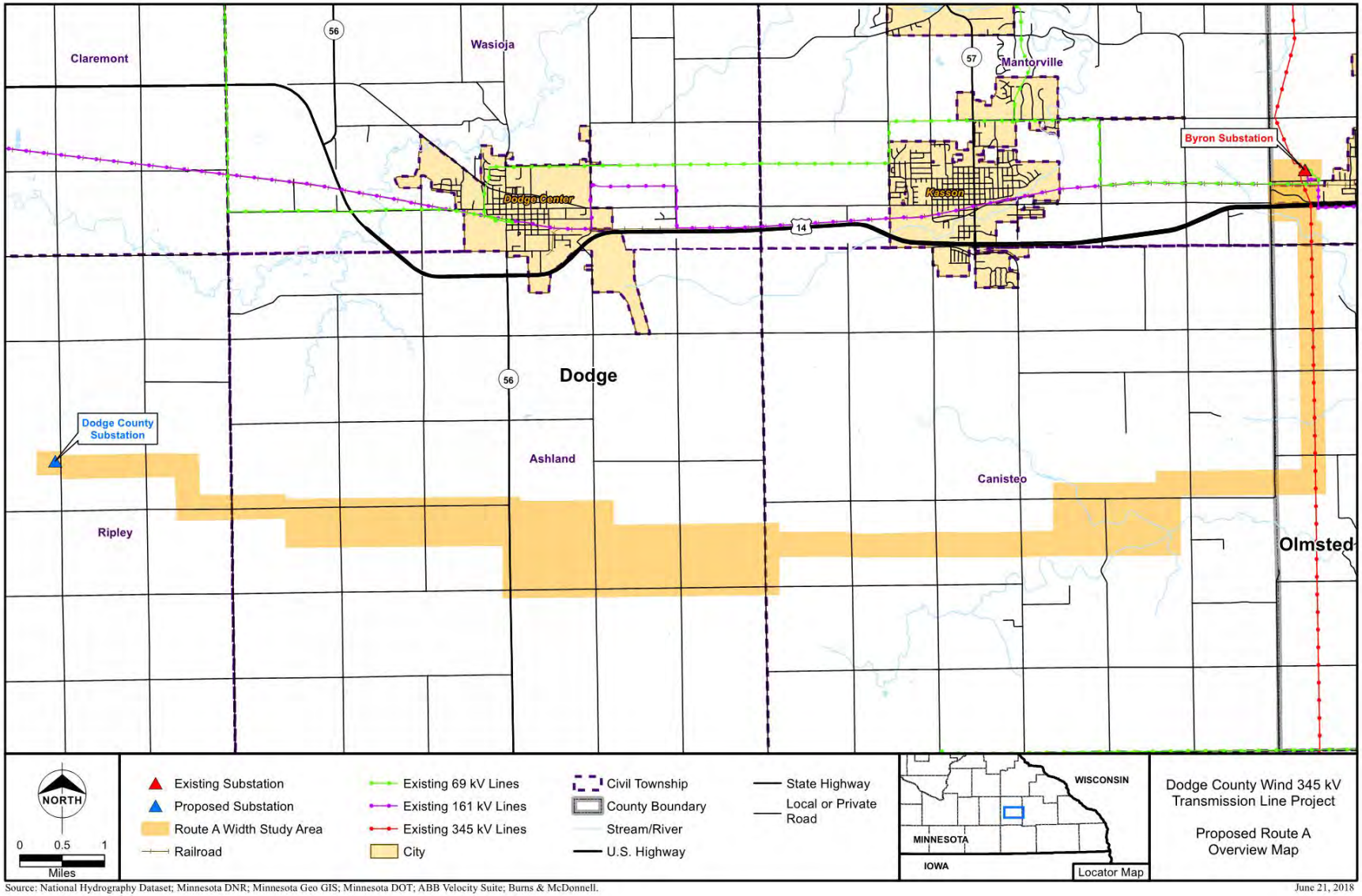
- Where Route B extends along 690th Street and 230th Avenue, the ROW would be approximately 66 feet wide (Sketch 1). Areas proposed for distribution underbuild would occur at 660th Street, 170th Street, and 650th Street (*see* **Appendix E**, Sketch 2).
- Where Route B extends along 670th Street, the ROW would be approximately 66 to 70 feet wide (*see* **Appendix E**, Sketch 2).
- Where Route B extends along MN 56, the ROW would be 150 feet wide (*see* **Appendix E**, Sketches 1 and 2).
- Where Route B extends along 700th Street, the ROW would be approximately 70 to 100 feet wide when within road ROW (design would be similar to **Appendix E**, Sketch 2, but at 70-feet of road ROW).
- Where Route B extends along 220th Avenue, the ROW would be approximately 100 to 120 feet wide when within road ROW, including portions proposed for distribution underbuild (**Appendix E**, Sketch 6).
- Where Route B extends along 270th Avenue, the ROW would be approximately 120 feet wide when within road ROW, including portions proposed for distribution underbuild (**Appendix E**, Sketch 7).

3.9 Detailed Description of Proposed Routes

3.9.1 Route A

Route A extends from the DCW Collection Substation through the townships of Ripley, Ashland, and Canisteo in Dodge County; and, through Salem and Kalmar Townships and the City of Byron in Olmsted County before terminating at the Byron Substation. The total length of Route A is approximately 21.4 miles. Approximately 14% of Route A (3.2 miles) parallels the existing Northern States Power Byron to Pleasant Valley 345 kV Transmission Line in Olmsted County. Route A would be located on new ROW, generally along roads, property boundaries, field edges, and section lines, where practicable. A 150-foot ROW would be established for the majority of the routes developed for the Project. Additionally, in areas where DCW proposes to locate the Project within the road ROW, the ROW would range from 66 to 150 feet. An overview of Route A for the Project is shown in **Figure 6** and detailed aerial maps are provided in **Appendix C (Detailed Aerial Maps)**.

Figure 6: Route A - Overview Map



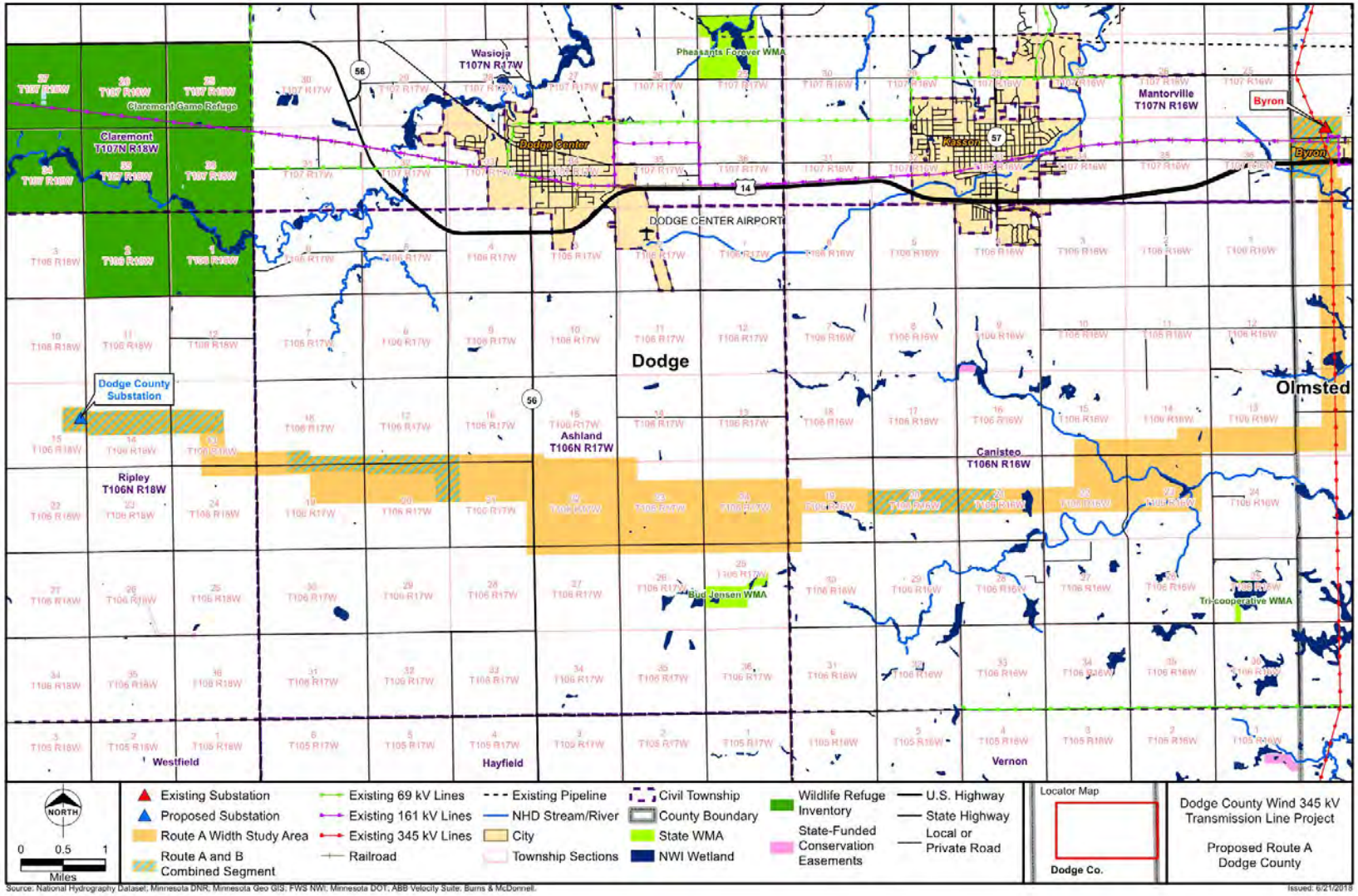
Source: National Hydrography Dataset; Minnesota DNR; Minnesota Geo GIS; Minnesota DOT; ABB Velocity Suite; Burns & McDonnell.

June 21, 2018

Route A Portion in Dodge County

In Dodge County, Route A originates at the DCW Collector Substation, located in Section 15 of the Ripley Township (**Figure 7; Appendix C (Detailed Aerial Maps)**). It extends south from the substation approximately 315 feet before turning east. Route A then extends approximately 1.5 miles to the east through Sections 13, 14, and 15 in Ripley Township, crossing 140th Avenue and 150th Avenue. Route A then travels south for 0.5 mile before turning east for another 0.5 mile paralleling 670th Street. Route A then crosses 160th Avenue and extends into Ashland Township for approximately 3.3 miles along 670th Street between Sections 16, 17, and 18. From this point, Route A turns south and parallels Minnesota Highway 56 for approximately 1.0 mile, crossing the highway to parallel on the east side. The route then extends east paralleling 680th Street for approximately 3.0 miles through Sections 22, 23, 24, 26, and 27 and crossing 220th Avenue, extending into Canisteo Township. Route A then extends north for approximately 0.5 mile through Section 19. At this point Route A extends east for approximately 3.5 miles crossing 230th Avenue, 240th Avenue, and 250th Avenue through Sections 19, 20, 21, and 22. Route A then turns north in Section 22 for approximately 0.2 mile before extending east for 0.2 mile and then heading 0.3 mile north to the north side of 670th Street. Route A then parallels 670th heading east for approximately 1.0 mile through Section 15 and Section 14. Route A then extends northeast for approximately 0.2 mile before extending east for approximately 1.3 miles, crossing 270th Avenue and Sections 13 and 14 in Canisteo Township before ending at the Dodge County Line and 280th Street.

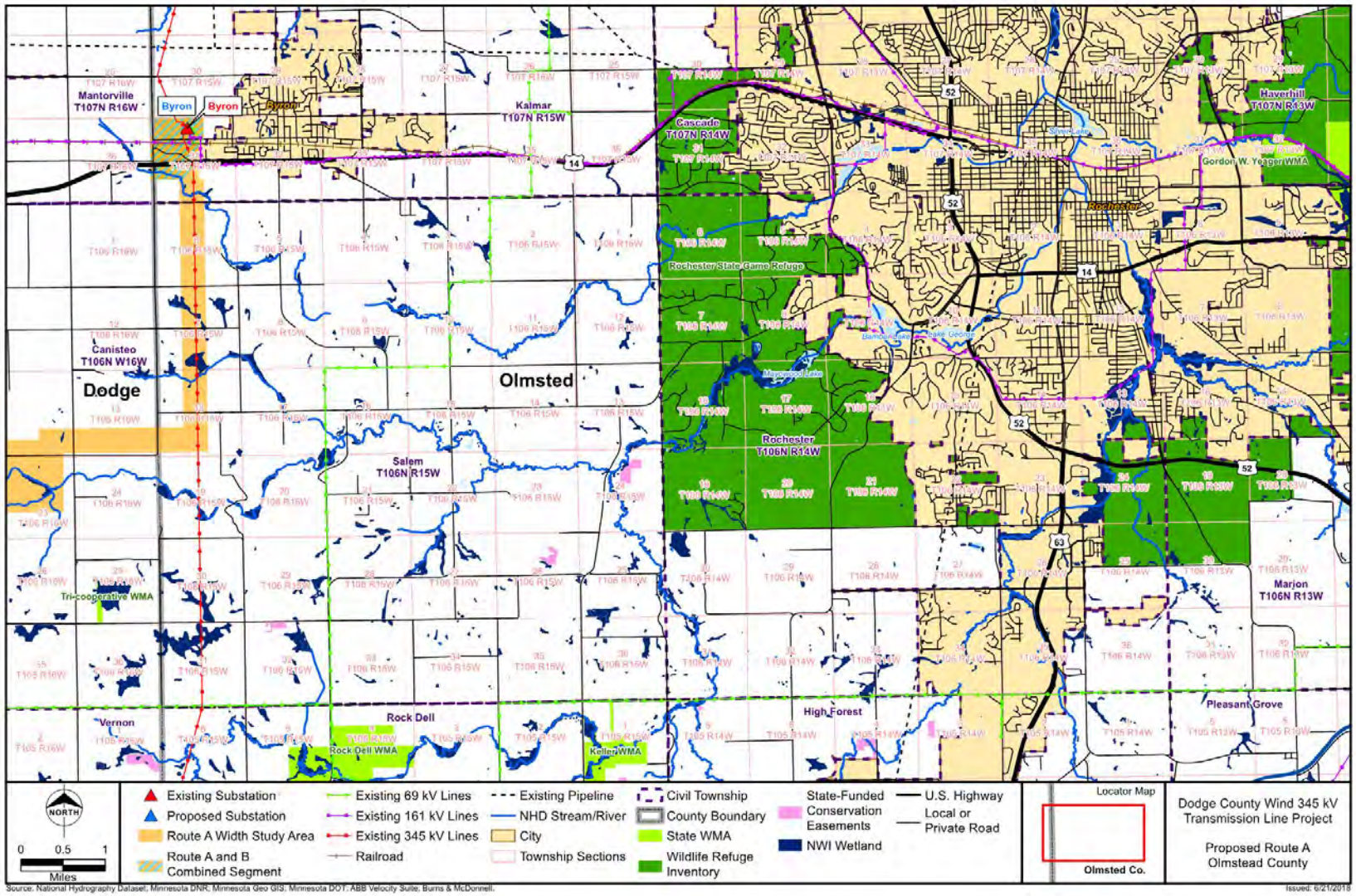
Figure 7: Route A - Dodge County



Route A Portion in Olmsted County

In Olmsted County, Route A continues eastward for approximately 0.4 mile in Section 18 of Salem Township (**Figure 8; Appendix C**). At this point Route A turns north and parallels the existing Northern States Power Byron to Pleasant Valley 345 kV transmission line for approximately 3.2 miles through Sections 18, 7, and 6 of Salem Township, crossing 20th Street, 15th Street, 10th Street, and Frontier Road into Section 31 of Kalmar Township. Route A then extends northwest for approximately 0.3 mile and then north for approximately 0.3 mile, crossing U.S. Highway 14 in Section 31. Route A then extends generally northeast and then east-northeast for approximately 0.2 mile, crossing 4th Street. Route A then turns north for approximately 445 feet in Section 31, terminating at the existing Byron Substation.

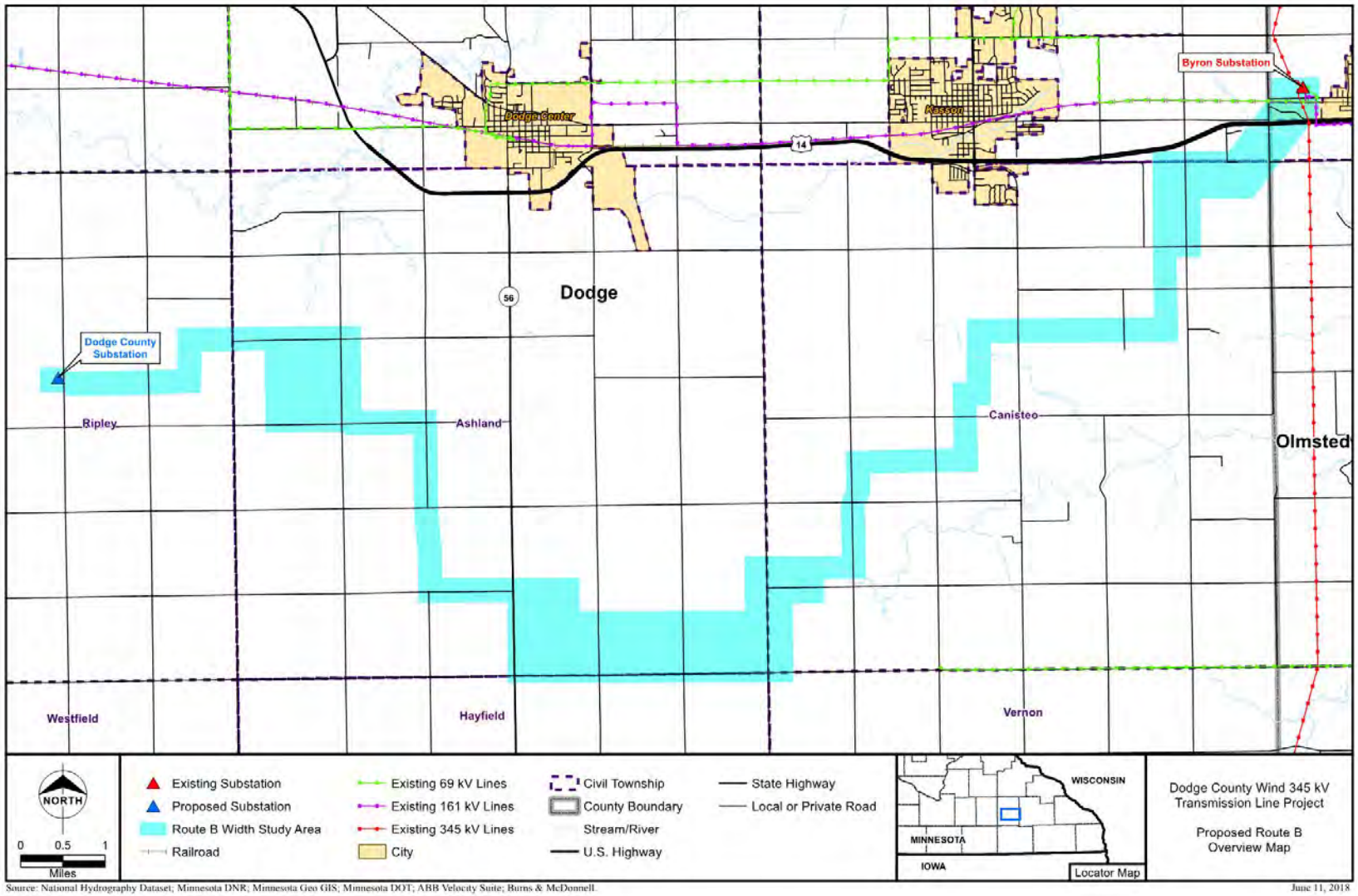
Figure 8: Route A - Olmsted County



3.9.2 Route B

Route B extends from the DCW Collector Substation through the townships of Ripley, Ashland, Hayfield, Canisteo, and Mantorville in Dodge County; and, through Kalmar Township in Olmsted County before terminating at the Byron Substation. The total length of Route B is approximately 26.3 miles. Route B would only parallel a short portion of an existing transmission line and would primarily be located on new ROW or within existing road ROW along roads, property boundaries, field edges, and section lines, where practicable. A 150-foot ROW would be established for the Project for portions of the line outside road ROW. An overview of Route B for the Project is shown in **Figure 9** and detailed aerial maps are provided in **Appendix C (Detailed Aerial Maps)**.

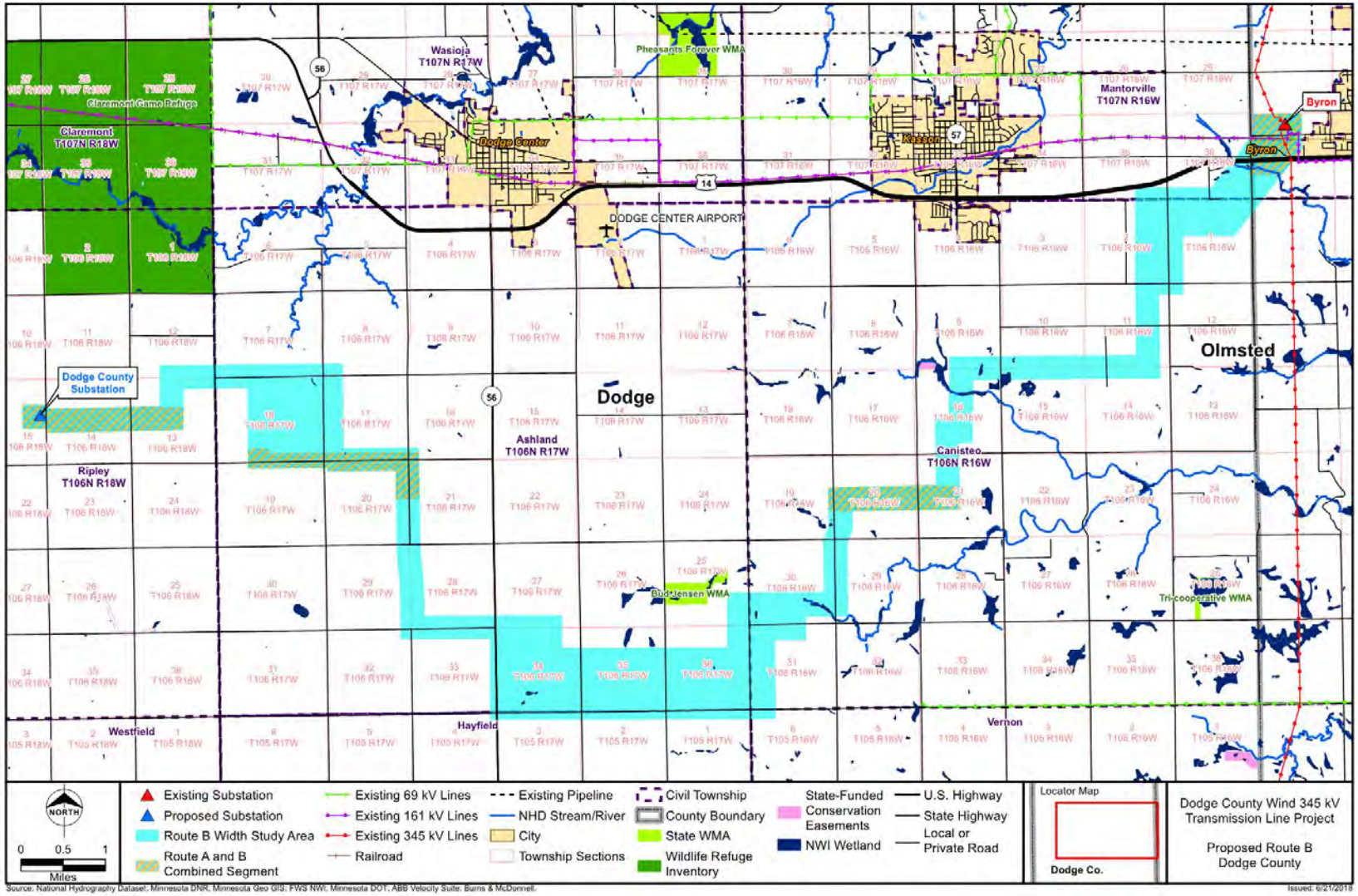
Figure 9: Route B - Overview Map



Route B Portion in Dodge County

In Dodge County, Route B originates at the DCW Collector Substation, located in Section 15 in Ripley Township (**Figure 10; Appendix C (Detailed Aerial Maps)**). Like Route A, Route B extends south from the Substation approximately 315 feet before turning east (the Route A and Route B combined segment in this area extends for approximately 1.5 miles). Route B then extends approximately 0.5 mile north in Section 13 of Ripley Township, departing from the alignment of Route A, and then extends east for approximately 0.5 mile. Route B then crosses 160th Avenue and continues east 1.3 miles through Section 18 of Ashland Township. Route B then extends south for 1.0 mile through Section 18 along 170th Avenue. Route B then extends along 670th Street for approximately 1.0 mile in Section 17 of Ashland Township along Route A. Route B then extends south for approximately 2.0 miles through Sections 20, 29, and 28 in Ashland Township along 180th Avenue, paralleling the west side of the road just south of 680th Street where it crosses to the east side of the road. Route B then extends east for approximately 1.0 mile through Section 28 and then extends south for approximately 1.0 mile paralleling Minnesota Highway 56 through Section 34. At this point Route B extends east for approximately 3.0 miles along 700th Street crossing 200th Avenue and 210th Avenue through Sections 34, 35, and 36 in Ashland Township and Sections 1, 2, and 3 in Hayfield Township. Along this 3.0-mile length the route jumps to the south side of the road twice. Route B then crosses into Canisteo Township and extends north for approximately 1.0 mile through Section 31, first along the west side of 220th Avenue then along the east side for approximately 0.7 mile. Route B then extends east for approximately 0.5 mile through Sections 30 and 31, turns north for approximately 0.2 mile, and then extends east for approximately 0.5 mile. At this point Route B extends generally north for approximately 1.3 miles crossing 680th Street and Sections 29 and 20. Route B then extends east for approximately 1.3 miles crossing 240th Avenue though Sections 20 and 21, before extending north for approximately 0.8 miles crossing 670th Street through Sections 21 and 16. At this point Route B extends east for approximately 0.2 mile before extending north for approximately 0.7 mile through Section 16. Route B then extends east for approximately 2.2 miles, crossing 250th Avenue and 262nd Avenue in Sections 9, 10, and 11. Route B then extends north for approximately 1.0 mile through Section 11, crossing 665th Street, before turning east and extending approximately 0.3 mile along 650th Street through Section 11. Route B then extends north approximately 1.0 mile through Section 2 of Canisteo Township before crossing 640th Street and crossing into Mantorville Township. At this point Route B extends east for approximately 0.3 mile through Section 36 of Mantorville Township before extending south for 0.2 mile into Section 1 of Canisteo Township. Route B then extends east for approximately 0.5 mile through Section 1 and then extends north and then northeast for approximately 0.6 mile crossing 640th Street and entering Section 36 of Mantorville Township. Route B then extends east-northeast for approximately 0.2 mile to the Dodge County border.

Figure 10: Route B - Dodge County



Route B Portion in Olmsted County

Upon entering Olmsted County and Kalmar Township, Route B continues to the east-northeast in Section 31 for approximately 0.2 mile (**Figure 11; Appendix C (Detailed Aerial Maps)**). Route B then extends north for approximately 0.3 mile, crossing U.S. Highway 14 in Section 31. Route B then extends generally northeast then east-northeast for approximately 0.2 mile, crossing 4th Street. Route B then turns north for approximately 445 feet in Section 31, terminating at the existing Byron Substation.

3.10 Overview of Impacts and Factors Considered

Table 4 below provides a summary of potential impacts and factors considered for the Project. **Sections 5 and 6** provide existing condition information as well as additional detail related to potential Project impacts.

Figure 11: Route B - Olmsted County

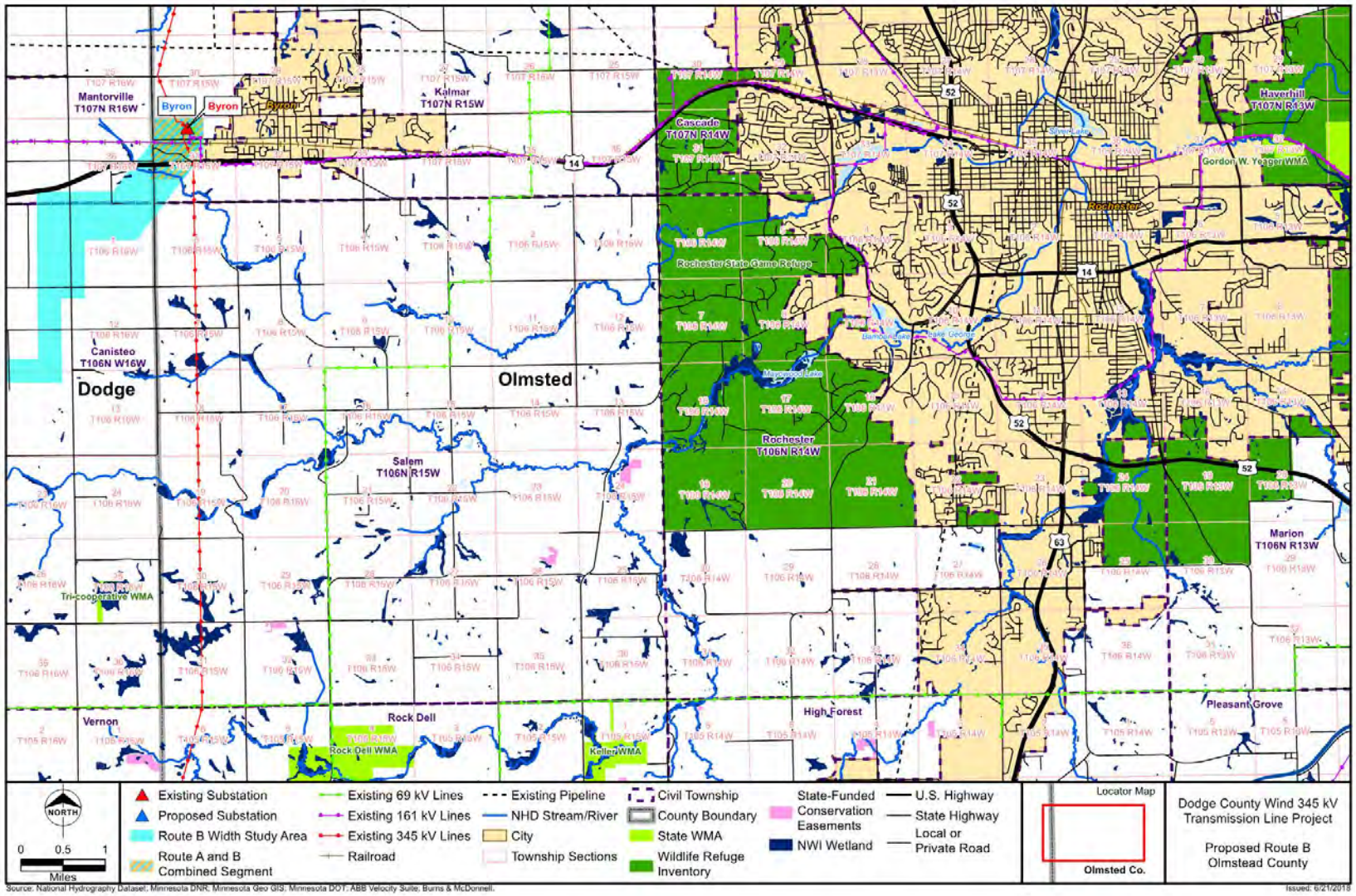


Table 4: Summary of Impacts and Factors Considered (Minn. Stat. § 216E.03, subd. 7 and Minn. R. 7850.4100)

Factor	Route A	Route B	Summary
Effects on Human Settlement			
Displacement	Route A is not expected to cause any displacement. A total of 29 residences occur within 500 feet of Route A alignment. The nearest residence is further than 75 feet from the alignment.	Route B is not expected to cause any displacement. A total of 31 residences occur within 500 feet of the Route B alignment. The nearest residence is located approximately 46 feet away.	Neither route will cause displacement. Route B has a residence that is located approximately 46 feet away from the alignment.
Sound	Activities associated with the construction of the transmission line and access roads may generate temporary sound. Sound generated from the operation of the Project would be in accordance with Minnesota Pollution Control Agency (MPCA) standards.	Activities associated with the construction of the transmission line and access roads may generate temporary sound. Sound generated from the operation of the Project would be in accordance with MPCA standards.	Sound associated with Route A and Route B will be in accordance with MPCA standards.
Radio, Television, Cellular Device, and Global Positioning System (GPS) Interference	Interference with radio, television, cell phones, and GPS signals is not anticipated. AM radio signals will only be impacted while underneath powerlines and television signals may be impacted if within the shadow of a transmission structure.	Interference with radio, television, cell phones, and GPS signals is not anticipated. AM radio signals will only be impacted while underneath powerlines and television signals may be impacted if within the shadow of a transmission structure.	Radio, television, cellular device, and GPS interference is not anticipated for either Route A or Route B.

Factor	Route A	Route B	Summary
Aesthetics	The Route A route width study area viewshed will be altered by construction of the Project. However, it will not create a new feature type within the landscape as overhead electric (OHE) transmission and distribution lines are already present. Route A parallels existing OHE lines for approximately 3.2 miles and crosses an existing wind farm.	The Route B Route width study area viewshed will be altered by construction of the Project. However, it will not create a new feature type within the landscape as OHE transmission and distribution lines are already present. Route B parallels existing OHE lines for approximately 0.1 miles.	The Route A and Route B viewsheds will be altered by the Project. However, they will not create a new feature type within the landscape as OHE transmission and distribution lines are already present. Route B parallels less existing OHE lines and does not cross through an active wind farm.
Socioeconomics	Impacts to socioeconomics are not anticipated.	Impacts to socioeconomics are not anticipated.	Impacts to socioeconomics are not anticipated from the construction of Route A or Route B.
Cultural Values	Impacts to cultural values are not anticipated.	Impacts to cultural values are not anticipated.	Impacts to cultural values are not anticipated from the construction of Route A or Route B.
Recreation	Two snowmobile trails are present within the Route A route width study area and cross the Route A ROW at 9 locations. Temporary impacts to hunting, wildlife observation, and snowmobiling activities and permanent impacts to snowmobiling activities are anticipated.	Two snowmobile trails are present within the Route B route width study area and cross the Route B ROW at 2 locations. Temporary impacts to hunting, wildlife observation, and snowmobiling activities and permanent impacts to snowmobiling activities are anticipated.	The Route A ROW includes more snowmobile trail crossings than the Route B ROW.

Factor	Route A	Route B	Summary
Public Services	Several public services and associated infrastructure are available within or near Route A. Significant impacts are not anticipated. Temporary impacts associated with an increase in traffic may occur.	Several public services and associated infrastructure are available within or near Route B. Significant impacts are not anticipated. Temporary impacts associated with an increase in traffic may occur.	Route A and Route B are not anticipated to have significant impacts to Public Services. Temporary impacts associated with an increase in traffic may occur.
Transportation	Several roadways are located within the Route A route width study area, most of which are lightly traveled. The Route A alignment crosses one Dakota, Minnesota and Eastern Railroad (DM&E) railroad. Route A is approximately 2.4 nautical miles from the nearest runway end at Dodge Center Airport (TOB) and crosses two obstacle identification surfaces (OIS). Temporary impacts to roadways associated with an increase in traffic may occur. No impacts to TOB anticipated due to anticipated structure heights. All structures will be filed with FAA.	Several roadways are located within the Route B route width study area, most of which are lightly traveled. The Route B alignment crosses one DM&E railroad. Route B is approximately 2.9 nautical miles from the nearest runway end at TOB. Route B does not cross any OIS. Temporary impacts to roadways associated with an increase in traffic may occur. No impacts to TOB anticipated due to anticipated structure heights. All structures will be filed with FAA.	Route A and Route B will likely result in temporary impacts associated with an increase in traffic. No impacts to aviation are anticipated.
Electric and Magnetic Fields	No impacts to human settlement are anticipated from Electric and Magnetic Fields as they dissipate as the distance from the source increases. Nearby residences are situated far enough away to not be impacted.	No impacts to human settlement are anticipated from Electric and Magnetic Fields as they dissipate as the distance from the source increases. Nearby residences are situated far enough away to not be impacted.	Route A and Route B will have no adverse effects to existing Human Settlement as the nearest residences are far enough away to not be impacted.

Factor	Route A	Route B	Summary
Effects on Public Health and Safety			
Public Health	No adverse effects to public health are expected due to the implementation of Route A.	No adverse effects to public health are expected due to the implementation of Route B.	Route A and Route B are not anticipated to have no adverse effects to Public Health.
Safety	Temporary construction activities associated with Route A are not anticipated to adversely affect public safety.	Temporary construction activities associated with Route B are not anticipated to adversely affect public safety.	Route A and Route B are not anticipated to adversely affect Public Safety.
Effects on Land-Based Economies			
Agriculture and Soils	The Route A ROW will impact approximately 239 acres of cultivated cropland. Agricultural crop production will largely remain unchanged as crops will be able to be planted up to the Route A alignment. The Route A ROW crosses approximately 323 acres of farmland classified as Prime Farmland, Prime Farmland if drained, and/or Farmland of Statewide Importance. Route A currently consists of 112 poles within land classified as cultivated crops and 3 poles within land classified as hay/pasture. Additionally, 183 poles will be placed in farmland classified as Prime Farmland, Prime Farmland if drained, and/or Farmland of Statewide Importance.	The Route B ROW will impact approximately 293 acres of cultivated cropland. Agricultural crop production will largely remain unchanged as crops will be able to be planted up to the Route B alignment. The Route B ROW crosses approximately 393 acres of farmland classified as Prime Farmland, Prime Farmland if drained, and/or Farmland of Statewide Importance. Route B currently consists of 187 poles within land classified as cultivated crops. Additionally, 280 poles will be placed in farmland classified as Prime Farmland and/or Prime Farmland if drained.	The Route A ROW will impact approximately 54 acres less of cultivated cropland compared to the Route B ROW and will cross approximately 70 acres less farmland classified as Prime Farmland, Prime Farmland if drained, and/or Farmland of Statewide Importance than Route. Additionally, Route B will include 72 more poles within land used for agriculture and 92 more poles within farmland classified as Prime Farmland and/or Prime Farmland if drained.
Forestry	No impacts to commercial forestry operations will occur.		

Factor	Route A	Route B	Summary
Tourism	No impacts to tourism are anticipated.		
Mining	No impacts to active mining operations will occur.		
Factor	**Route A**	**Route B**	**Summary**
Effects on Archaeological and Historic Resources			
Archaeological Resources	Known archaeological Resources are not located within the Route A route width study area and will not be impacted.	Known archaeological Resources are not located within the Route B route width study area and will not be impacted.	Both Route A and Route B have no known archaeological resources within their route widths and would not impact known archaeological resources.
Historic Resources	The Route A route width study area contains 4 architectural resources that have not been evaluated for listing on the National Register of Historic Places (NRHP). The Route A alignment would cross over 2 of these resources.	The Route B route width study area contains 3 architectural resources that have not been evaluated for listing on the NRHP. The Route B alignment would cross over 2 of these resources.	Both Route A and Route B would cross over 2 architectural resources that have not been evaluated for listing on the NRHP. The Route A route width study area has 1 more architectural resource than Route B. However, this resource has not been evaluated for listing on the NRHP.
Effects on the Natural Environment			
Air Quality	Temporary impacts to air quality associated with Route A from construction exhaust emissions and/or fugitive dust are expected to be negligible because of the relatively short construction timeframe. Additionally, negligible amounts of ozone will be created during the operation of Route A.	Temporary impacts to air quality associated with Route B from construction exhaust emissions and/or fugitive dust are expected to be negligible because of the relatively short construction timeframe. Additionally, negligible amounts of ozone will be created during the operation of Route B.	Permanent environmental impacts to air quality are not expected from the construction and operation of Route A or Route B.

Factor	Route A	Route B	Summary
Water Quality, Wetlands, Streams and Floodplains	Route A crosses 20 streams or rivers, which includes 6 Public Water Inventory (PWI) streams. Approximately 9.84 acres of wetland with approximately 1.34 acres of forested wetland and 2.67 acres of scrub-shrub wetland are crossed by the Route A ROW. The Route A ROW crosses approximately 4 acres of 100-year floodplains. Additionally Route A does not include any poles within wetlands or floodplains.	Route B crosses 26 rivers or streams, which includes 6 PWI streams (7 total PWI crossings). Approximately 11.64 acres of wetland with approximately 0.52 acres of forested wetland and 0.36 acres of scrub-shrub wetland are crossed by the Route B ROW. The Route B ROW crosses approximately 12 acres of 100-year floodplains. Additionally, Route B includes 4 poles within emergent wetlands and 4 poles within 100-year floodplains.	Route B would impact less forested and scrub-shrub wetlands even though the total wetland acreage crossed by the Route B ROW is more than the Route A ROW. Also, Route B crosses more streams and includes 1 more PWI stream crossing than Route A. Streams can likely be crossed aerially. The Route B ROW includes approximately 8 more acres of floodplain than the Route A ROW. Route B also includes 4 more poles within wetlands and 4 more poles within floodplains than Route A.
Primary Water Resources	Route A is within the Zumbro 8-digit Hydrologic Unit Code (HUC) watershed. Six primary surface waters occur within the Route A alignment.	Route B is within the Zumbro 8-digit HUC watershed. Seven primary surface waters occur within the Route B alignment.	Route B crosses 1 more primary surface water than Route A. Primary surface waters can likely be crossed aerially and impacts from both routes are not anticipated.
Groundwater Resources	Route A is located within 2 groundwater provinces. The Route A route width study area includes 26 wells.	Route B is located within 2 groundwater provinces. The Route B route study area includes 51 wells.	Route A and Route B are not anticipated to impact groundwater resources.

Factor	Route A	Route B	Summary
Flora	Route A largely spans agriculture (98% of the ROW avoids impacts to natural flora communities). The Route A ROW crosses 2 Sites of Biodiversity Significance (both with 'below' classifications). The ROW does not cross MNDNR native plant communities or prairies. Approximately 5 acres of natural vegetation is intersected by the ROW, including approximately 2 acres of deciduous woodland (GAP).	Route B largely spans agriculture (99% of ROW avoids impacts to natural flora communities). The Route B ROW does not cross any Sites of Biodiversity Significance, MNDNR native plant communities or prairies. Approximately 1.5 acres of natural vegetation is intersected by the ROW, including approximately 0.24 acres of deciduous woodland (GAP).	Route B likely will impact the least amount of natural flora communities and the fewest acres of deciduous woodland.
Fauna	WMAs or Important Bird Areas are not intersected by the Route A ROW. There are no known raptor nests intersected by the ROW. There is one known bald eagle nest in the region, situated more than 660' from the ROW. Permanent impacts to woodland habitats, particularly along Salem Creek – North Fork, have potential to impact tree roosting bat species and woodland bird species. Impacts to other terrestrial and aquatic/wetland wildlife species are expected to be minimal.	WMAs or Important Bird Areas not intersected by the Route B ROW. No known raptor nests are intersected by the ROW. There is one known bald eagle nest in the region. situated more than 660' from the ROW. Permanent impacts to woodland habitats have potential to impact tree roosting bat species and woodland bird species. Impacts to other terrestrial and aquatic/wetland wildlife species are expected to be minimal.	Routes A & B are not anticipated to directly impact raptor nest trees, but Route A will be located farther from the single known bald eagle nest within the region. Route B likely impacts fewer acres of tree roosting bat habitat. Impacts to other terrestrial and aquatic species are expected to be minimal for both Route A and Route B.

Factor	Route A	Route B	Summary
Effects on Rare and Unique Natural Resources			
Rare and Unique Natural Resources	The Route A ROW does not intersect records or critical habitat of federally listed Threatened and Endanger Species (TES). The Route A route width study area includes 3 observations of state listed TES, 2 of which intersect the Route A ROW. Additionally, 2 observations of state species of concern occur within the Route A route width study area. The Route A route width study area intersects 3 sites of Biodiversity Significance (2 'below' and 1 'moderate' classifications), with 2 "below" sites intersecting the ROW.	The Route B ROW does not intersect records or critical habitat of federally listed TES. The Route B route width study area includes 2 observations of state listed TES, 1 of which intersects the Route B ROW. Additionally, 1 observation of a state species of concern occurs within the Route B ROW. The Route B route width study area intersects 2 sites of Biodiversity Significance (1 'below' and 1 'moderate' classification), but neither intersect the Route B ROW.	Route B intersects fewer biodiverse habitat assemblages; the Route B ROW does not intersect any sites of Biodiversity Significance. Route B also intersects fewer known occurrences of state listed TES.
Design Options that Maximize Energy Efficiencies, Mitigate Adverse Environmental Effects, and Could Accommodate Expansion of Transmission or Generating Capacity			
General	The design of the facilities along both route options will maximize energy efficiencies and mitigate adverse environmental effects.		
Use or Paralleling of Existing Division Lines (miles)			
Survey Lines, Natural Division Lines, Agricultural Field Boundaries	3.7	6.8	Route B follows more agricultural field boundaries than Route A.

Use of Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-of-Way (miles)			
Existing Transportation Rights-of-Way	9.4	13.9	Route B would be located within more existing transportation ROWs than Route A.
Existing Electrical Transmission Systems or Rights-of-Way	3.2	0.1	Route B parallels substantially more existing transmission ROWs than Route A.
Existing Pipeline Systems or Rights-of-Way	0.0	0.0	Route A and Route B do not appear to be co-located or parallel existing pipeline ROWs.
Electrical System Reliability			
Electrical System Reliability	Both routes provide a reliable connection of the DCW generating facility to the electrical grid.		
Cost of Constructing, Operating, and Maintaining the Facility			
Construction Costs	Approximately 21 miles long Approximately $20.5 - $24.5 million	Approximately 26 miles long Approximately $26.0 - $31.5 million	Costs for the routes range from approximately $20.5-$31.5 million.
O&M Costs	The distance in overall project length would not result in any material differences in the O&M costs of either route option.		
Adverse Human and Natural Environment Effects Which Cannot be Avoided			
General	Unavoidable impacts include the conversion of land cover, impacts to agricultural land use, and impacts to the aesthetics of the region. The Applicant will work with landowners to mitigate for impacts to land use and the visual impacts, as appropriate.		

Irreversible and Irretrievable Commitments of Resources			
General	A commitment of people and resources would be required to successfully construct either of the route options. Some resources could be scrapped and recycled at the end of the life of the Project, such as concrete and rock for foundations and aggregate backfill, steel poles, conductor and shield wires. Other resources would be irreversibly committed to the Project and would be irretrievable. These would include trees cleared along the ROW, and fuels and lubricants used by equipment during construction. Resources committed would be similar for either route due to the same general area being crossed by the route.		
Route Specific	Route A is approximately 21.4 miles long and would require approximately 190 structures.	Route B is approximately 26.3 miles long and would require approximately 250 structures.	Resources commitments for the two routes are generally anticipated to be comparable

Tables summarizing the impacts of the routes and project collector substation are including with this Application as **Appendix F (Impact Tables for Route A, Route B, and Project Collector Substation)**.

4.0 ENGINEERING DESIGN, CONSTRUCTION & ROW ACQUISITION

4.1 Transmission Line Engineering and Operational Design

DCW is proposing the construction of a single circuit 345 kV alternating current (AC) high voltage transmission line. The AC transmission lines consist of three separate phases of conductors. Typically, at higher voltages, such as 345 kV, multiple sub-conductors per phase are common. Multiple sub-conductors are described as bundled conductors. DCW is proposing the use of aluminum conductor steel reinforced (ACSR) cable. These cables are stranded steel cores surrounded by strands of aluminum. Other conductor types must be evaluated during detailed design to confirm the most optimal conductor is selected for economic impacts, including losses and loading. Single circuit lines consist of three phases, and typically one to two shield wires. DCW anticipates the use of optical ground wire (OPGW) or 3/8" extra high strength steel conductor as the proposed shield wires. Shield wires are installed above the electrical phases to prevent damage from lightning strikes. OPGW is also used to carry communication signals between substations.

Each energized wire will be carried at the end of an insulator designed for proper electrical clearance. Structure configuration utilized for the Project will be optimized during detailed design based on system requirements, design constraints, voltage of transmission, and cost effects.

4.1.1 Transmission Line Structures and Conductor Design

DCW proposes to use 345 kV single circuit monopole structures for the majority of the Project. Steel structures will be either weathering or galvanized steel. Technical drawings of all the structures are available in **Appendix G (Technical Drawings of Proposed Structures)**. Proposed span lengths for the generation tie line are approximately 500 to 1,200 feet, with an average span of approximately 1,000 feet. Structures are proposed to be 80 to 140 feet above ground line depending on terrain and span length. Poles will be optimized to have the shortest height possible while maintaining all required clearances. Single pole tangent type structures will be direct embedded, unless deemed not feasible during detailed design. If it is not feasible to directly embed a pole, concrete piers may be used. Angle and terminal structures will be direct embedded and guyed, utilizing anchors to support loading of the line. Other specialty structures may be necessary due to environmental conditions, terrain, land owner requirements, or along road ROW. The specific design requirements for each structure will be confirmed once detailed survey work, soil sampling, and final route design has been performed.

Each conductor phase will consist of a bundled 795 kcmil 26/7 Drake ACSR conductor. Each conductor is approximately 1.107 inches in diameter. Each ACSR cable consists of a core of seven steel strands surrounded by twenty-six aluminum strands. Each sub-conductor will have a capacity of approximately 991.3 Amps.

Table 5 provides a summary of the technical information for the family of structures that DCW is seeking to use for the Project. **Figures 12** and **13** provide representative photos of the most common type of tangent structures. **Figure 12** is a representative structure from a 230 kV generation tie line, while **Figure 13** is same 345 kV transmission structure set forth in the recent Huntley to Wilmarth application in docket No. TL-17-185. A more precise design of the structures identified in **Table 5** is in **Appendix G (Technical Drawings of Proposed Structures)**.

DCW will design the Project to meet or surpass all applicable state and local building codes and NESC requirements. DCW performed an assessment of the Project's potential obstruction issues on the nearby TOB. Following this assessment, it was determined that both Route A and Route B do not cross through the most restrictive areas associated with the obstruction surfaces for this airport; therefore, no anticipated obstruction issues with either Route A or Route B on TOB should occur (see **Sections 5.5.10** and **6.5.10** for additional detail on obstruction issues for Route A and B, respectively). Prior to the commencement of construction operations, DCW will run required evaluations with the FAA to determine all structure heights are acceptable and documented for local registered runways. Appropriate safety protocols, procedures, and standards will be followed during design and construction, and after installation.

Table 5: 345 kV Structure Design Summary

Design Configuration	Initial Operation	Structure Type	Structure Material	ROW Width (feet)	Structure Height (Above Ground) (feet)	Structure Base Diameter (feet)	Excavation Diameter (feet)	Span Between Structures (feet)
345 kV	345 kV	**Tangent Single Pole Braced Post Delta (0°-2°)**	**Steel**	**150**	**80-135**	**3-4**	**4-5**	**500-1200**
		Tangent Single Pole Braced Post Vertical (0°-2°)	**Steel**	**75-150**	**100-135**	**3-4**	**4-5**	**400-1200**
		Guyed Deadend (35°-95°)	**Steel**	**150**	**80-140**	**3-4**	**4-5**	**500-1100**
		Self-Support Deadend (0°-90°)	**Steel**	**75-150**	**80-140**	**6-8**	**10-12**	**400-1100**
		Light Angle	**Steel**	**75-150**	**80-140**	**3-5**	**5-10**	**500-1200**

Design Configuration	Initial Operation	Structure Type	Structure Material	ROW Width (feet)	Structure Height (Above Ground) (feet)	Structure Base Diameter (feet)	Excavation Diameter (feet)	Span Between Structures (feet)
		(2°-15°)						
		Medium Angle (15°-40°)	Steel	75-150	80-140	3-5	5-10	500-1200
		3-Pole Deadend (0°-90°)	Steel	100-150	80-130	3-5	5-10	500-1100

Figure 12: Representative Single-Circuit Structure Sample Photograph

Figure 13: 345 kV Steel Single-Circuit Tangent

4.1.2 Transmission ROW

DCW proposes constructing the new single circuit 345 kV generation tie line within a proposed typical 150-foot ROW. The generation tie line will be constructed so that conductor blowout will not exit the ROW along the route, unless the landowner provided written consent. For those portions of the Project in a road ROW, DCW proposes to locate the generation tie line within the road ROW (which ranges from approximately 60 feet to 150 feet wide) depending on which specific road is being paralleled by the generation tie line (see **Section 3.8** for additional detail on the proposed Project ROW). DCW has consulted with Dodge County Public Works and Dodge County Planning and Zoning regarding the use of this road ROW. The consultations with Dodge County will continue to assist in locating the Project within road ROW. There is no road ROW sharing anticipated to occur in Olmsted County.

DCW will implement a vegetation management program, as required NERC Reliability Standard FAC-003, that includes the Standard's clearance requirements in the generation tie line design. This program accounts for voltage specified clearance to the edge of a ROW under multiple wind conditions for safe operation of the generation tie line under all design conditions. Required clearances for vegetation management meet NERC Reliability Standard FAC-003 requirements and ANSI Z133.1 recommendations.

DCW will acquire crossing permits, as required, from counties and existing utilities with exclusive ROWs. If overhang or blowout agreements are required prior to construction, these agreements will be obtained from the necessary parties. When designing, acquiring the generation tie line route, and siting the Project structures, DCW will be guided by the following factors and requirements:

- Minn. Stat. Chapter 216E, Minn. Stat. Sections 216E.01 and 216E.03 and Minn. R. part 7850.4100;

- That all DCW transmission infrastructure on private lands will be placed within acquired easements;

- For those portions of the route that are located along road ROW, DCW will locate the Project within the road ROW and will consult with Dodge County and MN/DOT for those portions of the Project in the road ROW;

- Minimization of contact with environmentally sensitive areas, streams, forested areas, and other valuable natural habitats;

- That the conductors will not be allowed to exit the ROW (blowout) in any area unless permitted by the agreements with the landowners or Dodge County or Olmsted County ROW; and

- That the poles will be located to minimize impacts to the property owners, which is determined through discussions with participating property owners.

The Project is a generation tie line specifically designed as a radial line to deliver energy from the DCW LWECS to the electric gird. Therefore, the Project is not designed to accommodate future expansion, as may be the case with a network or looped transmission line.

4.2 Identification of Existing Corridors

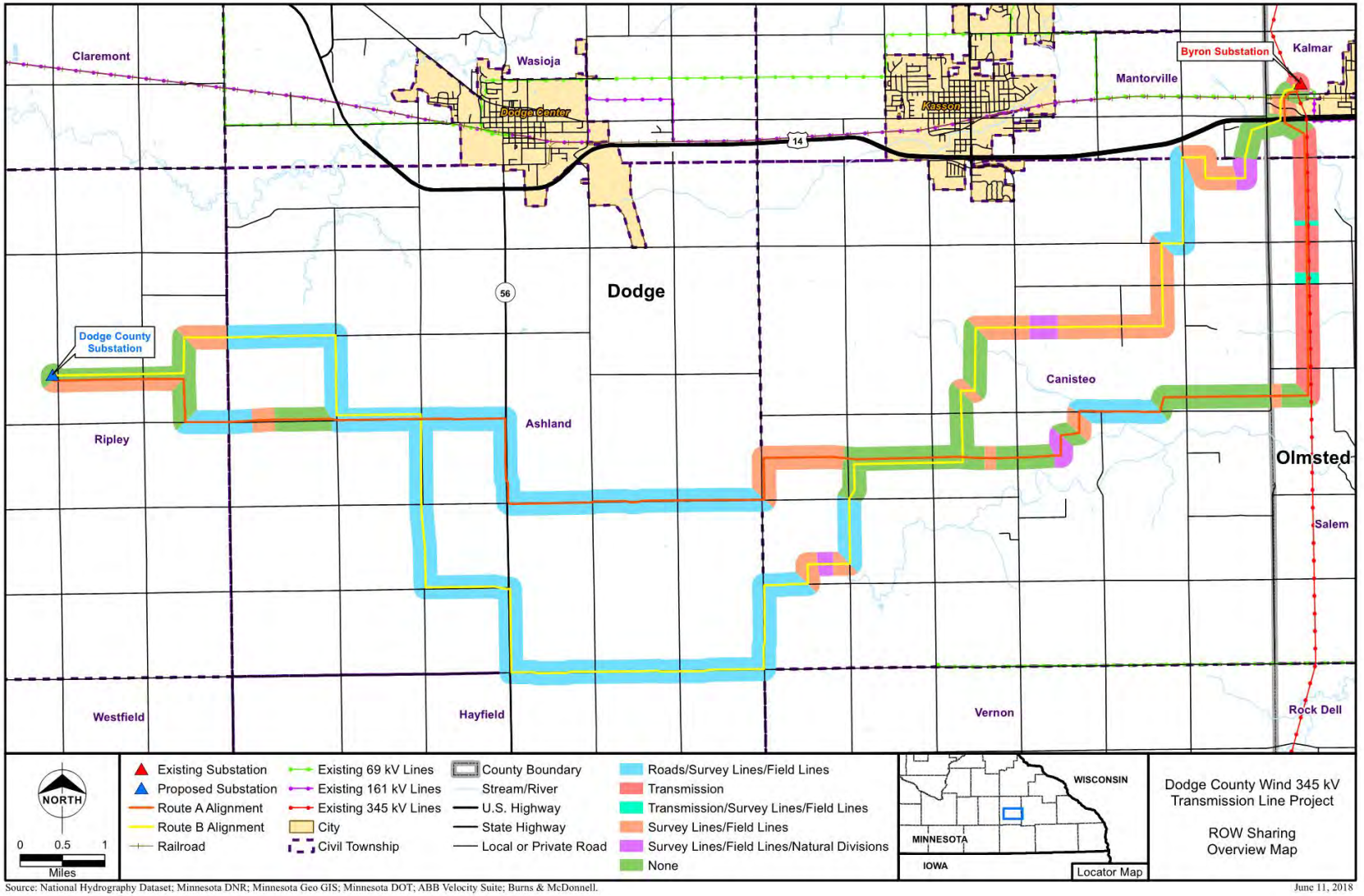
Following the selection of the termini points for the Project, DCW investigated the existing linear corridors across the Project Notice Area. For both Route A and Route B, potential linear corridors, including existing pipeline, field and division lines of land, high-voltage transmission lines, and existing transportation corridors were evaluated.

Table 6 lists the existing utility, survey/field, and transportation corridors identified within the DCW Project Notice Area for both Route A and Route B (shown in **Figure 14**). **Appendix H (Environmental Feature Maps)** includes data output on linear feature sharing for the Project.

Table 6: Summary of Length of Existing Linear Features Paralleled by Proposed Routes

Route	Length (miles)	T-line (miles)	Road (miles)	Rail (miles)	Pipeline (miles)	Field, Division, Survey Lines (miles)	None (miles)	Total Paralleled Length (miles)	% of Length Paralleling Linear Features
A	21.4	3.2	7.8	0.0	0.0	12.3	6.1	15.3	71.5
B	26.3	0.1	11.2	0.0	0.0	20.9	5.3	21.0	79.8

Figure 14: ROW Sharing



4.3 ROW Evaluation and Acquisition

Since the initiation of ROW acquisition process in early 2017, DCW has contacted over 240 individual landowners. DCW continues to meet with landowners underlying Route A and Route B with the objective of securing voluntary easements for the entire Project. The typical ROW evaluation process employed by DCW includes title examination, initial owner contacts, survey work, document preparation, easement negotiation, and purchase. In addition, during this process, DCW has worked extensively with landowners to identify the preferred location for the Project in landowners' parcels, including adjusting the location of the ROW to account for vegetation preferences, outbuildings, and the following of fence lines and crop lines, where feasible. The following paragraphs describe the process used by DCW during the easement acquisition process.

Prior to contacting individual landowners, DCW conducted title searches on targeted parcels to identify all persons and entities that have recorded interests in the affected real estate. A title company was engaged to complete the public records search on targeted parcels. DCW produces a title report for each parcel to document the legal description and the owners of record, and to report information regarding easements, liens, restrictions, encumbrances, and other conditions of record. During the identification of landowners, a DCW ROW agent contacts each landowner or the landowner's representative. At the initial meeting, the ROW agent describes the Project and the proposed impact to the landowner's property. During these discussions, DCW's agent also reviews specific landowner issues or concerns regarding the construction, operation, and maintenance of the Project on their property.

The ROW agent requests the landowner's permission for survey crews to enter the property to conduct any necessary preliminary surveys and examinations. Surveys are conducted to establish ROW corridors, natural and manmade features, and associated elevations, which are used during detailed engineering of the generation tie line. Soil borings may be taken by an independent geotechnical testing company to assess soil conditions and determine appropriate foundation design. During or before initial contact with a landowner after a Route Permit has been issued by the Commission, DCW will provide landowners with a copy of the Route Permit and any other materials the Commission determines are necessary.

The ROW agent also discusses where the structure(s) may be located on the landowner's property (including an estimate of potential span distances and the approximate number of poles on the parcel), as well as the specific boundaries of the easement area. If requested or allowed by the landowner, DCW also stakes the proposed generation tie line's location. The ROW agent then collects area land value data to determine the amount of just compensation to be offered for the rights to build, operate, and maintain the transmission facilities within the easement area and reasonable access to the easement area. The agent also provides the landowner with a map of the generation tie line route across the landowner's parcel and negotiates with the landowner

regarding compensation for the generation tie line easement. An appraisal may be obtained to resolve any complicated valuation issues. The landowner will be allowed a reasonable amount of time to consider the offer and to present any information that the owner believes is relevant to determining the property's value. The ROW agent will prepare the documents required to complete each transaction, which may include an easement and subordination agreements (including purchase agreements for the DCW Collector Substation).

4.4 Transmission and Substation Construction Procedures

4.4.1 General Construction

Construction on the Project will begin after all applicable federal, state, and local approvals have been obtained, the necessary property and ROW are acquired, soil conditions are established, and final design for the Project has been completed. DCW will work with an experienced contractor to construct the generation tie line. Also, DCW will employ standard construction and mitigation practices developed from NEER's extensive project management experience as well as industry-specific Best Management Practices (BMPs). The proposed Project BMPs are discussed in the "Impacts and Mitigation" sections of **Section 5** and **Section 6** for each individual resource (*e.g.*, soils, groundwater, wetlands) analyzed for this Project. DCW will also comply with all applicable local, state, and federal permit requirements.

To minimize Project impacts, DCW will develop and implement construction and mitigation practices based on the Project's needs. These practices and activities may include, but are not limited to, safety and storm water pollution prevention planning, agricultural mitigation planning, staging, generation tie line structure erection, conductor stringing, and maintenance and inspection. In some cases, Project construction activities such as scheduling may be modified to minimize impacts to sensitive environmental resources in the study area. In addition, any contractors or subcontractors involved in construction of the Project will be instructed on the protection of archaeological, cultural, and ecological resources, as well as all applicable permit requirements. DCW construction contractors will also be informed of Federal, state, and local laws regarding antiquities, fossils, plants, and wildlife (including collection and removal).

Initially, affected landowners will be contacted and notified of the start of construction and provided detail regarding construction activities. If temporary removal or relocation of gates or fencing is necessary, installation of temporary or permanent gates will be coordinated with the landowner. Depending on the timing of Project construction, the ROW agent will work with the property owner for early harvest of crops, where possible, with compensation to be paid for any actual crop losses or in accordance with the landowner easement. During the construction process, it may be necessary for the property owner to remove or relocate equipment and livestock from the ROW. Compensation related to these activities will be discussed with the landowner during easement negotiations.

DCW will use many different types of construction equipment to complete the Project. Initially, chain saws, mowers, cranes, bucket trucks, tractors, pickup trucks and flatbed trucks, backhoes, and bulldozers will be used where needed to clear vegetation from the Project ROW and staging areas. After vegetation clearing, typical construction equipment used on the Project might consist of digger-derrick line trucks, track-mounted drill rigs, dump trucks, front end loaders, bucket trucks, bulldozers, flatbed tractor-trailers, pickup trucks, concrete trucks, and various trailers. Many types of excavation equipment are set on wheel or track-driven vehicles depending on terrain and soil conditions. Steel structures are transported on tractor-trailers.

4.4.2 Construction Sequence

Construction of the Project will follow a typical sequence of construction timing including surveying the centerline, determining applicable construction access, storm water pollution prevention mitigation installation, ROW clearing, grubbing and grading, material delivery, installing foundations, assembling, erecting and setting of structures, installing insulators, shield wires and conductors, and installing ground rods. Construction will be followed by cleanup and site reclamation. Various phases of construction are outlined in greater detail below. The construction phases discussed in the following sections can occur at different locations throughout the construction process, and, in many cases, simultaneously at different locations throughout the Project Notice Area.

4.4.3 Surveying and Staging

The first phase of construction activities on the Project will involve survey staking of the generation tie line centerline, property boundaries, environmental constraints and pole locations, followed by the installation of all storm water pollution prevention mitigation equipment. Secured staging areas will be established throughout the Project Notice Area, typically along the Project ROW or in areas adjacent to the Project ROW. The staging areas for the Project will be selected for their proximity to the line, ease of access, security, and ability to efficiently and safely store supplies, and would be chosen to minimize excavation and grading. Staging areas are used as delivery locations for the contractor's equipment and materials necessary to construct the new Project facilities. The materials, equipment, structures and contractor's vehicles would be stored at these staging areas until they are needed. Temporary lay-down areas may also be required for additional space for storage during construction. Potential impacts from temporary lay down areas and any staging areas outside of the generation tie line ROW would be obtained from landowners through construction easement agreements.

DCW anticipates that two temporary construction material and equipment laydown areas would be used for the duration of construction activities on the Project. These laydown areas would each be approximately 15 acres in size. Construction laydown areas are typically located at previously-disturbed or developed locations such as vacant lots or agricultural lands, where feasible, in order to reduce impacts on underlying or nearby sensitive resources. Material for the

Project will be placed on pallets or cribbing within the designated laydown or staging areas. Temporary staging and laydown areas will be returned to pre-construction condition upon completion of the Project.

Geotechnical studies would be conducted along the Project route to determine engineering requirements for structures and foundations. Truck-mounted augers will be transported to selected locations to drill small-diameter boreholes, and borehole cuttings will be analyzed to determine specific soil characteristics. If feasible, these activities would be conducted after harvest to minimize impacts on agricultural fields. Minimal land disturbance (approximately 400 square feet per boring) is anticipated for each geotechnical boring site. Additionally, small access trails may be required for some of the boring locations. Affected landowners will be contacted and notified of all necessary access for geotechnical studies prior to the commencement of major construction activities.

4.4.4 Clearing

Following surveying and staging activities, DCW will install the necessary preliminary access roads and matting (where required), as well as remove any trees (including clearing and grubbing) to ensure that any remaining vegetation meets the NESC standards. Vegetation clearing will also provide the construction crew with easy access to the construction site(s). Some low-growing brush or specific tree species that remain below 14 feet may be allowed at the outer limits of the easement area. Taller trees within the ROW that might compromise the safe and reliable operation of the Project will be removed.

In developed areas, existing low-growing vegetation that will not pose a risk to the Project or impede construction or maintenance may remain in the easement area. Trees beyond the easement area that are in danger of falling into the energized generation tie line ("danger timber") will be removed or trimmed to eliminate the hazard. Clearing of ROW and vegetation management will be in accordance with transmission vegetation management program (TVMP) terms. This program identifies four major radial clearances for the maintenance of generation tie lines. These clearances are defined as flashover clearance (1.0 PU CFO PH-G Air Gap), minimum vegetation clearance distances (MVCD clearance), desired clearance (ANSI Z133.1 – Table 2), and trigger clearance (ANSI Z133.1 – Table 1). Initial clearing of ROW must meet necessary clearances. In special circumstances, tree trimming agreements may be possible to minimize tree removal based on negotiations with individual landowners. All materials resulting from clearing will either be: (i) chipped on site and spread on the ROW; (ii) stacked in the ROW for use by the property owner; or (iii) removed and disposed of as agreed with the property owner during easement negotiations. Surveyors will final stake the construction corridor within the approved ROW and the pole locations of the approved alignment after the vegetation has been removed in preparation for the construction crew.

4.4.5 Construction in Environmentally Sensitive Areas

In certain locations within the Project Notice Area, environmentally sensitive and wetland areas may also require special construction techniques. Construction mats may be placed in wet or soft soil locations and in narrow ditches to minimize disturbance. Construction crews will maintain comprehensive water and soil conservation practices during construction and operation of the facilities to protect topsoil and adjacent water resources and to minimize soil erosion. Practices for the Project may include containing excavated material, protecting exposed soil, and stabilizing restored soil. Impacts to wetlands will be minimized through construction BMPs, including specific measures to protect topsoil, minimize soil erosion, re-vegetate disturbed areas with non-invasive species, and protect wetland resources from direct and indirect impacts (see **Section 5.8.5** and **Section 6.7.5** for more information on proposed BMPs in wetlands for Route A and B, respectively). To the extent possible, DCW will avoid construction in wetlands, but some impacts to wetlands within the Project Notice Area are anticipated (see **Section 5.8.5** and **Section 6.8.5** for additional discussion on potential impacts to wetlands underlying Route A and Route B, respectively).

Crews will avoid major disturbance of individual wetlands and drainage systems during construction activities. This will be accomplished by strategically locating new access roads and spanning wetlands and drainage systems, where feasible. When it is not feasible to span a wetland, construction crews will rely on several additional options during construction to minimize impacts to wetlands:

- Crews will attempt to access the wetland with the least amount of physical impact to the wetland (*i.e.*, shortest route).
- The structures will be assembled on upland areas before they are brought to the site for installation.
- Construction mats will be used to minimize impacts to the extent practicable. These mats also can provide access to sensitive areas to minimize impacts at the site. These construction practices also help prevent soil erosion.

4.4.6 Access Road Construction

To assist with the necessary access to the Project, the construction crew may install temporary culverts and access road where needed to gain entrance to the ROW and to maintain adequate access and drainage throughout construction. Access to the ROW corridor is typically made directly from existing roads or paths that run parallel or perpendicular to the generation tie line ROW. In some situations, private roads or existing trails can be used. Permission from the property owner will be obtained prior to accessing the ROW. Where necessary to accommodate the heavy equipment used in construction, including cranes, concrete trucks, and drilling equipment, existing access roads may be upgraded or new access may be constructed in the Project Notice Area. New access may also be constructed when no current access is available, or

when the existing access is inadequate to cross roadway ditches or safely access portions of the line. To the extent possible, DCW will coordinate these activities with the affected property owner(s) and/or state and local highway departments.

Once the ROW is cleared and graded, access roads will be installed to support the heavy equipment necessary for foundation installation, pole framing erection, and wire stringing. These access roads are generally temporary and require minimal grading and filling for the safe movement of vehicles, equipment, and materials. Generation tie line structures are generally designed for installation at existing grades; however, some sloped work areas may need to be graded or filled in order to establish a more level work surface for structure installation. It is anticipated that only minimal grading will be needed because the preferred route has very little significant elevation change. But if fill is required and the landowner permits, it is preferred to leave the leveled areas and working pads in place for future maintenance activities. If permission is not granted, the site will be graded back as close as possible to its original condition, and all fill, including temporary culverts and road approaches, will be removed from the site and disturbed areas will be returned to pre-construction conditions.

4.4.7 Transmission Construction

Due to the extensive agricultural and pasture areas along both the Route A and Route B ROWs, generation tie line structure site clearing is expected to be minimal over a large portion of the Project. In areas of difficult terrain, structure location sites may require more extensive leveling, using bulldozers or front-end loaders to provide for the safe operation of equipment. In areas where access is extremely difficult, structure placement may be performed through the use of helicopters. All blading and leveling would occur within the boundary of the ROW or construction easement areas throughout the length of the Project. Soil removed during leveling of structure sites will be stockpiled nearby and replaced following construction or provided to the landowner for their use. Disturbed ground would be re-graded to as close to pre-construction condition as appropriate for stabilization and revegetated or approved for tillage, depending on existing land uses present.

After the structure pads are stabilized, the structure foundations will be installed. These foundations may consist of concrete caissons, or the structures may be direct buried into augured holes. Caissons will be used in any place where guying is not feasible, such as a self-supporting angle structure or self-supporting dead-end structure. Most steel pole structures are anticipated to be directly buried and would not require a caisson foundation. Foundations for direct embed steel pole structures would require excavating or auguring a hole approximately 20 to 30 feet deep and approximately 5 to 6 feet in diameter. Structures with caissons would require a hole 25 to 50 feet deep and approximately 8 to 12 feet in diameter. Exact excavation dimensions will depend upon soil conditions, and whether the structures would support an angle.

Once the foundations are ready, the structures, insulators, hardware, clamps, and grounding equipment will be sent from the staging areas to the appropriate staked structure location. The structures would typically be placed within the ROW until set. Steel arms and/or insulator assemblies would be attached directly to the structures while on the ground. Mast arms would be attached to the top of the structure for the shield wires. Additional hardware and pulling blocks would then be attached to the insulators. Steel structures will then be lifted, placed in the excavated hole, or placed and secured on the concrete foundation by a crane or similar heavy-lift equipment. The holes will be back-filled with select aggregate or concrete. Concrete trucks will deliver the concrete from a local batch plant. Excess soil from foundation holes will be offered to the landowner for disposal on the structure site or other location on the property within reasonable proximity to the construction site. If on-site disposal is not permitted, it will be completely removed from the site.

Angle structures as well as some tangent structures would typically be guyed. Guy wires would be anchored using screw anchors, cross plate anchors, or rock anchors depending on the soil conditions encountered.

Once structures, anchors and guys are in place, conductors are installed by establishing stringing setup areas within the ROW or on temporary construction easement areas outside of the ROW. Conductors will be installed by establishing stringing setup areas within the ROW, occurring typically every two miles, where the spools of conductor cable will be stored. Temporary guard or clearance structures will be installed as needed over existing distribution or communication lines, streets, roads, highways, railways, or other obstructions after any necessary notifications are made and the required permits obtained. Conductors will not obstruct traffic or contact existing energized conductors or other cables due to the use of guard structures, particularly when working in or parallel to the road ROW.

In addition to constructing the Project across private lands, both Route A and Route B propose to construct a portion of the route within county road ROW. For Route A, this includes approximately 7.8 miles of length within county road ROW, or roughly 36% of the total length of Route A. For Route B, the road ROW would amount to approximately 11.2 miles, or roughly 43% of the total Route B length. For the portions of the Project within county road ROW, a unique structure design (using brace posts; **Appendix E (ROW Sketches)**), and shorter span lengths will allow the Project to be located within the road ROW, which ranges from approximately 66 to 100 feet in width for Route A and approximately 66 to 150 feet for Route B. All road ROW sharing for both Route A and Route B would occur in Dodge County. For areas where the Project is located in the county road ROW, DCW will work with MN/DOT and Dodge County to confirm that all applicable utility accommodation policies and procedures are followed. It is anticipated that DCW will coordinate construction activities with MN/DOT and Dodge County so that a traffic management plan can be developed for specific roadways or areas where specific setbacks or mitigation measures are necessary to construct the Project in accordance with all applicable transportation safety requirements.

Once the steel pole structures have been erected, either a helicopter will fly along or ground crews will drive along the Project ROW, securing the conductor pulling line through stringing blocks suspended from the insulators on the poles. The pulling line will be used to pull the conductor through each block and later to achieve the required tension. Finally, the conductor will be clipped in using bucket trucks or helicopters once final sag is established. The shield wire will be installed in a similar manner.

4.4.8 Collector Substation Construction

DCW proposes to construct one new collector substation in southwestern Dodge County – the DCW Collector Substation. DCW has executed an option to purchase up to ten acres to construct the new DCW Collector Substation on existing agricultural land along 140th Avenue in Ripley Township (*see* **Appendix C (Detailed Aerial Maps)**). However, the substation graveled footprint is anticipated to be no larger than one acre. Additional detailed design engineering will confirm the exact expansion size based on equipment needs.

The Project will also require modification of the existing Byron Substation, on the west side of Byron, Minnesota. The Byron Substation has sufficient space for the new 345 kV line and associated substation equipment. The four existing transmission lines (Northern States Power 345 kV and 161 kV; SMMPA 69 kV and 161 kV) that enter the Byron Substation will be modified to account for the new 345 kV line and equipment.

The general construction practices proposed for the DCW Collector Substation are outlined below. It is anticipated that the expansion and improvements required for the Byron Substation would require similar construction activities, but would be limited in scope to the required improvements necessary to safely construct and maintain the 345 kV line in proximity to the other four circuits present at the Byron Substation.

Following survey and staking of the both substation locations, erosion control BMPs will be implemented, including structural controls such as straw wattles, silt fencing, and erosion control blankets/mats, as well as temporary seeding and use of hydro-mulch. Site access will also be prepared, including installation of any necessary culverts in adjacent road drainages. No extensive woodland or vegetation clearing is anticipated at either substation location; both substation sites will be graded and fenced. Concrete pads and footing for equipment will be installed. Aggregate will be spread throughout the fenced area. Equipment will be delivered to the site and generally stored inside the fenced area, although some materials may need to be stored on the property outside the fence due to size or safety considerations. Equipment such as circuit breakers, bus work, capacitors, and dead-ends will be assembled and installed. Transformers will be delivered to the site and installed. Substation control house and supervisory control and data acquisition equipment will be installed. Upon completion of construction activities, disturbed areas outside the fence will be restored and erosion control measures removed.

4.5 Restoration Procedures

During construction activities, it is likely that the Project will disturb areas within the construction easement areas, staging areas, or the Project ROW. However, DCW will take steps to lessen the impact of the Project on the surrounding environment by restoring areas disturbed by construction in accordance with BMPs and the Project's permit conditions. BMPs for soils include minimizing the number of vehicles, and the protection and maintenance of topsoil during ROW clearing and generation tie line construction. Additionally, to the extent practicable, DCW will re-grade or restore construction areas not needed for maintenance access, so all surfaces drain naturally and are reseeded with native vegetation via a seed mixture certified as free of noxious or invasive weeds (see **Sections 5.8.8.4** and **Section 6.7.8.4** for additional BMPs related to site restoration for Route A and B, respectively). Once construction of the Project is complete the temporary road approaches and access roads installed for the Project will be removed, revegetated, and restored to their original condition to the extent practicable, and as negotiated with each landowner or responsible agency/official. Reclamation activities will include removing and disposing of debris, dismantling all temporary facilities, leveling or filling tire ruts, and controlling erosion. Reseeding areas disturbed during construction will be done with a seed mix free of noxious weeds, similar to that which was removed.

DCW will contact each property owner after construction is completed to address any damage that has not been previously handled as a result of the construction of the Project. If damage has occurred to crops, fences or the property, DCW will fairly compensate the landowner for the damages sustained in accordance with the terms and conditions agreed upon in the easement agreement with the landowner. In certain situations, DCW may engage an outside contractor to restore the damaged property to its original condition to the extent practicable. Portions of permanent vegetation that are disturbed or removed during construction of the generation tie line will be reestablished to pre-disturbance conditions.

Areas of the Project where vegetation is disturbed or removed during construction will be allowed to naturally reestablish to pre-disturbance conditions. Resilient species of common grasses and shrubs typically reestablish with few problems after disturbance. Areas with significant soil compaction and disturbance from construction activities may require assistance to reestablish vegetation and control soil erosion. Commonly used methods to accomplish this include, but are not limited to, prompt reseeding of disturbed areas, erosion control blankets, silt fences, and weekly inspection of construction sites for compliance. These erosion control and vegetation establishment practices are regularly used in NEER construction projects to minimize long-term impacts and are referenced in construction permit plans.

4.6 Maintenance Procedures - Overview

Affiliates of NEER, like DCW, utilize NEER's existing transmission field operations organization that is responsible for approximately 8,500 miles of transmission lines and

transmission voltage generation ties up to 500 kV across all NERC jurisdictions in the United States. These facilities are planned, maintained, and operated in compliance with applicable NERC Reliability Standards. The O&M organization has a program of maintenance standards providing the capability to manage compliance to transmission maintenance standards. DCW will use these O&M experts to develop and implement procedures for the maintenance of the Project. The attributes of the DCW maintenance procedures will be informed by NEER affiliates that already have:

- Well-established O&M practices and standardized processes, which are already being used to operating high voltage transmission facilities.
- Access to over 766 power system professionals, including technicians and other staff, with expertise in all aspects of transmission and substation equipment installation, maintenance and repair.
- Experience from O&M power delivery assets in all NERC jurisdictions at voltages up to 500 kV.
- An excellent record of transmission and substation reliability, built on robust design and O&M programs that incorporate condition assessment, diagnostics, and asset management for effective and efficient investment of resources and capital.
- Experience addressing a wide variety of operating challenges ranging from hurricanes, tornadoes, and other high wind conditions, dust contamination, avian interaction, and lightning. For example, outages are followed up by an Event Response Process in which NEER affiliates uses diagnostic techniques to identify the root cause of a problem to prevent reoccurrence. Solutions to transmission O&M problems include new designs, new conditions assessment processes, and/or new products. NEER affiliates also often work directly with equipment manufacturers to develop these solutions in order to continually improve the reliability of its transmission systems.

Based on the above, consistent with the applicable NERC Reliability Standards, regular maintenance of the Project will include vegetation patrol and management, generation tie line visual inspection, detailed climbing inspection, special assessments of the line, and general facilities/grounds upkeep. These and other proposed maintenance activities are discussed below in greater detail for the Project.

4.6.1 DCW Maintenance Procedures

Regular maintenance and inspections will be performed during the life of the Project. Access to the ROW used by the Project is required periodically to perform inspections, conduct maintenance, and repair damage. Generally, DCW will inspect the generation tie line annually. Inspections will be limited to the ROW and areas where obstructions or terrain may require off-ROW access. If problems are found during inspections, repairs will be performed, and the landowner will be compensated for damage that results.

The ROW will be managed to remove vegetation that interferes with the O&M of the Project. Native shrubs that will not interfere with the safe operation of the Project will be allowed to reestablish in the ROW. DCW's practice provides for the inspection of the generation tie line annually to determine if clearing is required. Clearing practices include a combination of mechanical and hand clearing, along with herbicide application where allowed to remove or control vegetation growth.

The Minnesota Noxious Weed Law defines a noxious weed as an annual, biennial, or perennial plant that the Commissioner of Agriculture designates to be injurious to the public health, the environment, public roads, crops, livestock, or other property. The Minnesota Department of Agriculture's (MDA) Noxious & Invasive Weed Program assists local governments and landowners with resources for managing noxious and invasive weeds throughout Minnesota. DCW will attempt to limit the spread of noxious and invasive weeds by cleaning construction equipment before it enters the construction work area and by using only invasive-free mulches, topsoil, and seed mixes.

All herbicides used by the DCW will be approved by the U.S. Environmental Protection Agency (EPA) and the MDA. These herbicides are applied by commercial pesticide applicators that are licensed by the MDA. If during post-construction monitoring of the restored ROW a higher density and cover of noxious weeds on the ROW is noted when compared to adjacent off-ROW areas, DCW will obtain landowner permission and work to mitigate noxious weed concerns.

Generation tie 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%. The principal O&M cost for transmission facilities is the cost of inspections. Annual O&M costs for generation tie lines and transmission lines in Minnesota and surrounding states vary, however, for voltages from 69 kV through 345 kV, past experience shows that costs are approximately $900 per mile. Actual line-specific maintenance costs depend on the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the line.

4.7 Electric and Magnetic Fields and Stray Voltage

Electric and Magnetic fields are typically separated at low frequencies (in this case, 60 hertz (Hz)) and are calculated separately. The magnitude and direction of the force that is exerted on a stationary electrical charge defines the electric field (EF). The EF is determined by the voltage of the generation tie line. Similarly, the same forces applied to the electrical charges determine the magnetic field (MF). The current on the generation tie line will impact the MF.

4.7.1 Electric Fields

There is no federal standard for generation tie line or transmission line electric fields. The Commission, however, has historically imposed a maximum electric field limit of 8 kV/m measured at one meter above the ground.[6] The standard was designed to prevent serious hazards from shocks when touching large objects parked under AC transmission lines of 500 kV or greater. As **Figures 15** and **16** and **Table 7** show, the Project is below this threshold.

The Project's associated EF is calculated to be 5.17 kV/m at 25 feet from the centerline, and between 25 and 50 feet from the centerline the EF does not surpass 6.0 kV/M. Calculated EFs for the typical structure type proposed for the Project are provided in **Table 7**. Existing transmission lines that parallel the Project are not included as part of this calculation. The fields generated by those lines will be determined during detailed engineering and through communications with transmission line owners. The Project's EF will not exceed 8.0 kV/m within the ROW.

[6] *In the Matter of the Route Permit Application for a 345 kV Transmission Line From Brookings County, Docket No. ET-2/TL-08-1471*, Order Granting Route Permit (adopting Finding 194 of ALJ) (Sept. 14, 2010).

Figure 15: Calculated Electric Fields (kV/m) for the Proposed 345 Kilovolt Single Circuit Tangent Delta Configuration Generation Tie Line (3.28 feet above ground)

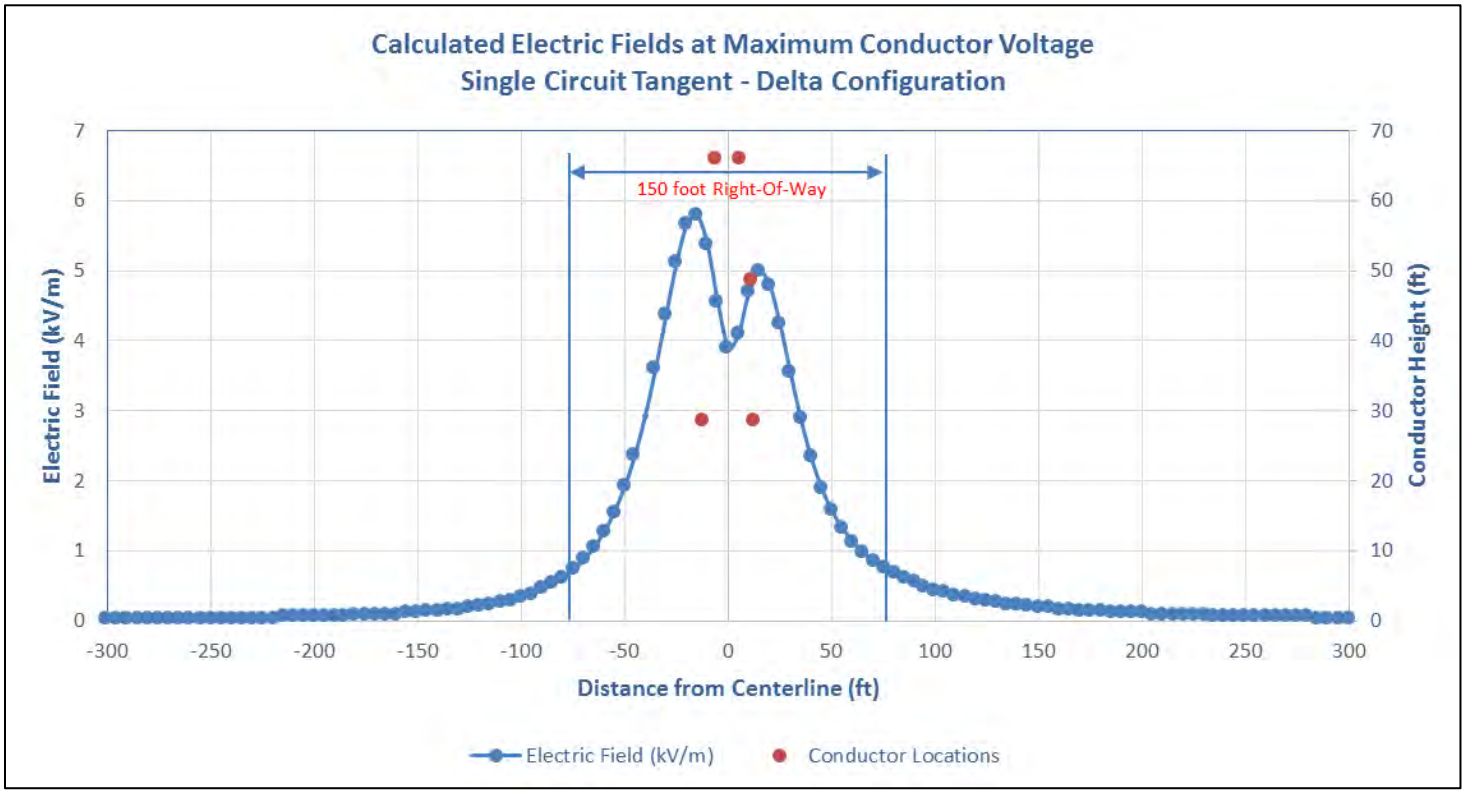


Figure 16: Calculated Electric Fields (kV/m) for the Proposed 345 Kilovolt Single Circuit Tangent Vertical Configuration Generation tie line (3.28 feet above ground)

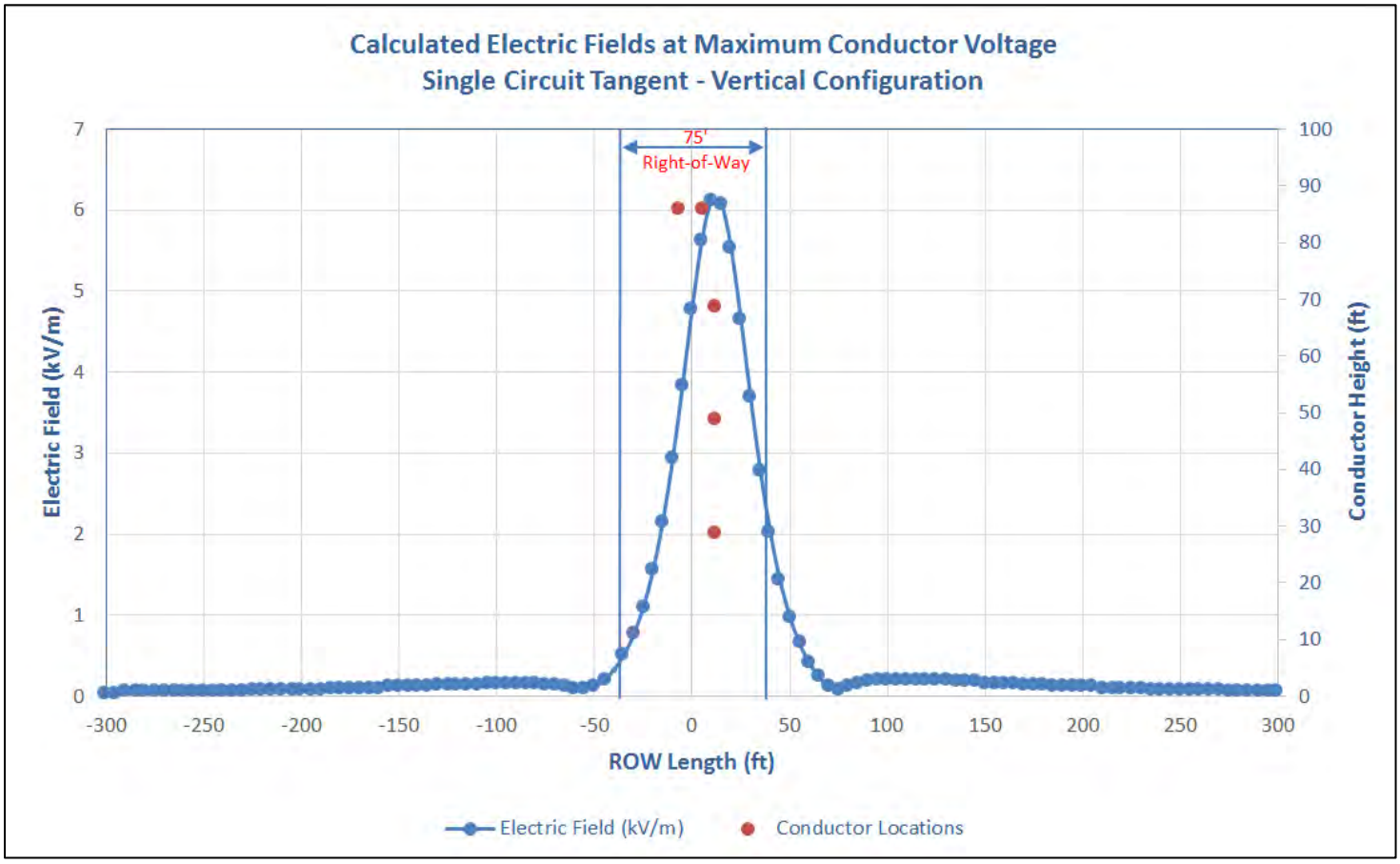


Table 7: Estimated Electric Fields (kV/m)

Structure Type	Max. Conductor Voltage	Distance to Proposed Centerline (in feet)												
		-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
Single Pole Delta Tangent (0°-2°) 345 kV	379.5 kV	0.03	0.06	0.33	0.71	1.90	5.17	3.96	4.30	1.58	0.78	0.45	0.11	0.04
Single Pole Vertical Tangent (0°-2°) 345 kV	379.5 kV	0.04	0.08	0.15	0.14	0.12	1.1	4.8	4.6	1.0	0.08	0.2	0.1	0.05

4.7.2 Magnetic Fields

There is no Minnesota or federal standard on MF. Institute of Electrical and Electronic Engineers (IEEE) C95.6 provides the following guidance regarding low frequency (60 Hz) MF. The fields should not exceed 9,046 mG within or at the edge of the ROW. The peak MF values are calculated at a height of one meter above the ground. The same method is used to calculate the MF at the edge of the ROW. The maximum calculated MF profiles around the transmission lines for the typical structure type and initial operation being considered for the Project in the year it is put into service (2019) are shown in **Figures 17** and **18** and **Table 8.**

Figure 17: Calculated Magnetic Flux density (mG) for the Proposed 345 Kilovolt Single Circuit Tangent Delta Configuration Generation tie line (3.28 feet above ground)

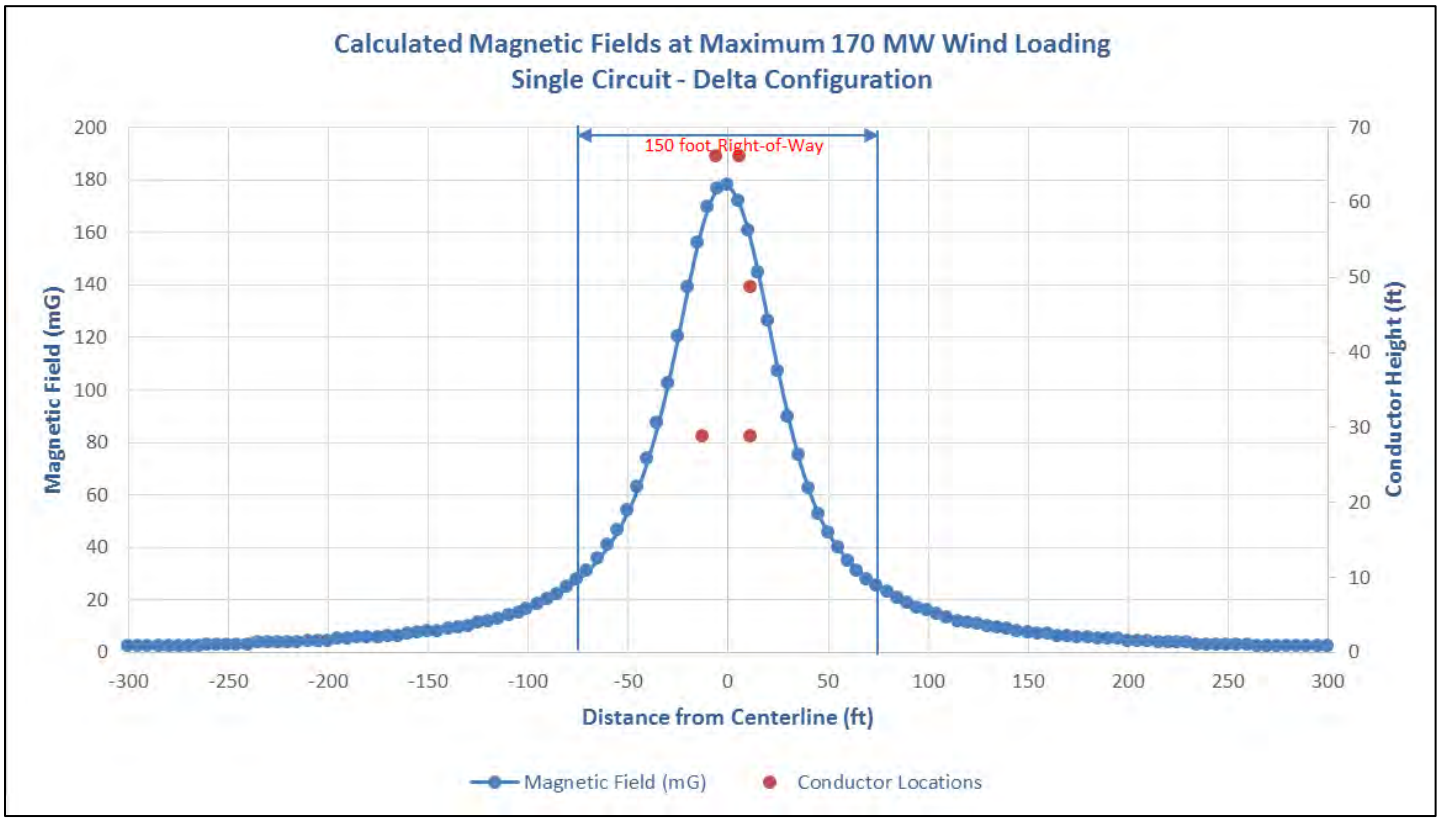


Figure 18: Calculated Magnetic Flux density (mG) for the Proposed 345 Kilovolt Single Circuit Tangent Vertical Configuration Generation tie line (3.28 feet above ground)

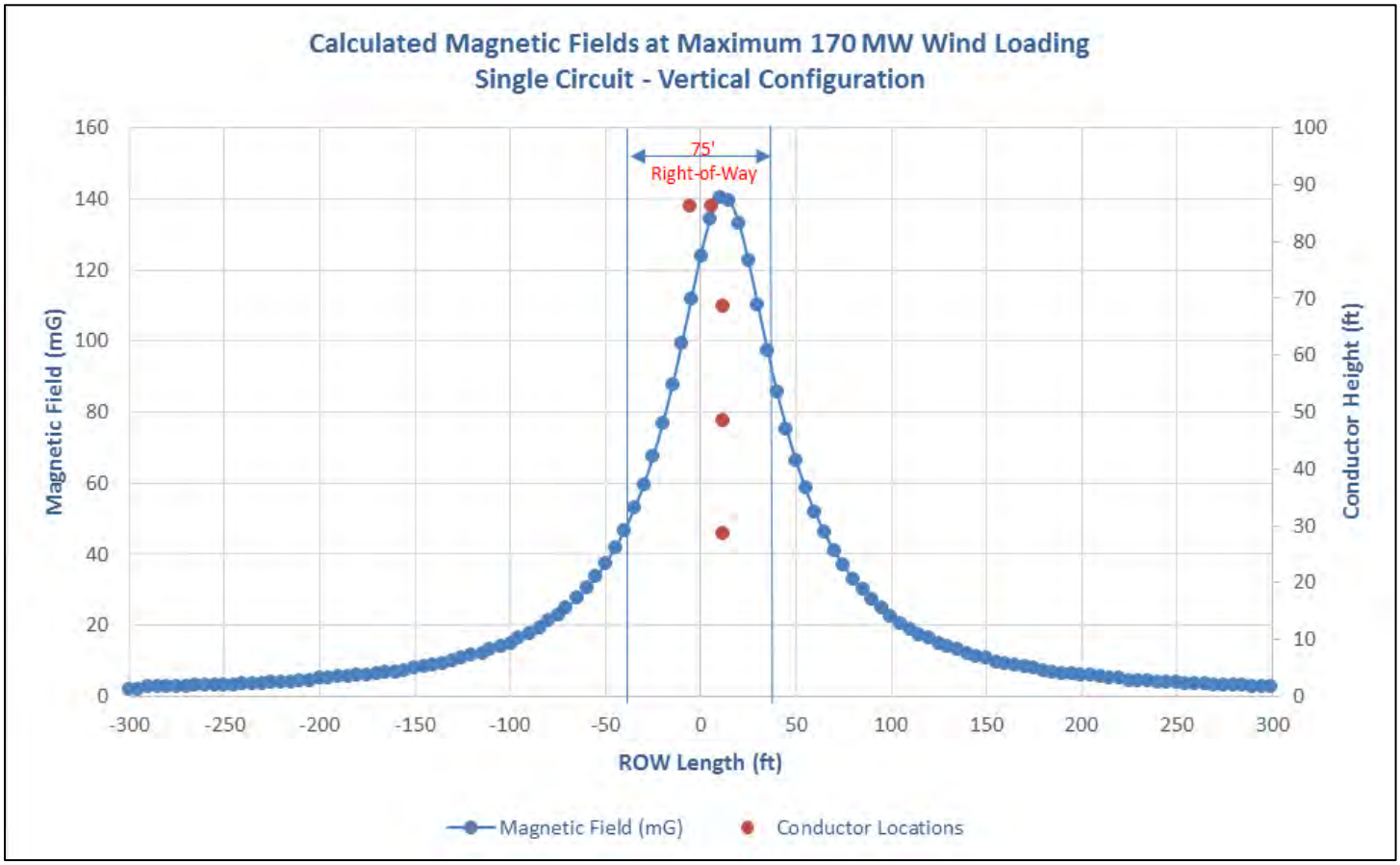


Table 8: Estimated Magnetic Fields (mG)

Structure Type	System Condition	Current (Amps)	Distance to Proposed Centerline (in feet)												
			-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
Single Pole Delta Tangent (0°-2°) 345 kV	Normal	284.5	1.96	4.37	16.47	27.7	53.8	120	177	107	45	25	15.5	4.3	1.94
Single Pole Vertical Tangent (0°-2°) 345 kV	Normal	248.5	2.26	4.76	15.1	22.7	37.4	67.5	124	123	66	36.8	22.5	6.0	2.6

4.7.3 Stray Voltage

Stray Voltage, as defined by IEEE, is a voltage resulting from the normal delivery and/or use of electricity (usually smaller than 10 volts) that may be present between two conductive surfaces that can be simultaneously contacted by members of the general public and/or their animals. Stray voltage is caused by primary and/or secondary return current, and power system induced currents, as these currents flow through the impedance of the intended return pathway, its parallel conductive pathways, and conductive loops in close proximity to the power system. Stray voltage is not related to power system faults and is generally not considered hazardous.

DCW's generation tie line will not be connected to the local distribution system, and, therefore, no stray voltage on the local electrical system is anticipated. However, if necessary, appropriate measures will be taken to mitigate stray voltage when the transmission lines parallel or cross distribution lines. Any stray voltage circumstances will be more evident once a route is selected and more design work has been completed.

4.8 Existing Transmission Line ROW Paralleling Considerations

Existing transmission line ROWs were investigated to determine if Project routes could parallel existing facilities. No existing transmission facilities extend from the proposed DCW Collector Substation to the Byron Substation, so paralleling an existing transmission line ROW for the entire Project is not feasible. Existing transmission lines extending into the Byron Substation were also investigated for the potential to parallel the Project. The Byron to Pleasant Valley 345 kV transmission line extends north to the Byron Substation in the eastern portion of the Project Notice Area and provided an opportunity for Route A to parallel existing ROW for approximately 3.2 miles. Route B parallels the Byron to Pleasant Valley line for a short distance near the Bryon Substation, and does not parallel any other transmission facilities.

5.0 ENVIRONMENTAL INFORMATION: ROUTE A

5.1 Environmental Setting

Route A is located in southeastern Minnesota within Dodge and Olmsted counties, approximately 10 miles west of Rochester and 70 miles south of Minneapolis. The Route A route width study area is dominated by cropland and a moderately extensive network of agricultural ditches and intermittent and ephemeral streams, many of which support herbaceous riparian buffers. The general topography of the Route A route width study area is described as undulating, rolling relief with approximate elevations between 1,330 and 1,125 feet above mean sea level (MSL). Route A generally slopes east and is located north of Salem Creek, a tributary of the Zumbro River that eventually flows to the Mississippi River.

Ecoregion mapping data from the EPA indicates that the Route A route width study area is located within the Eastern Iowa and Minnesota Drift Plains ecoregion (Level IV) of the Western Corn Belt Plains ecoregion (Level III) and the Rochester/Paleozoic Plateau Upland ecoregion (Level IV) of the Driftless Area ecoregion (Level III) (USEPA 2015). The Western Corn Belt Plains ecoregion is characterized by fertile undulating plains overlain by glacial tills with scattered stream systems, and is dominated by row crops and some pasture. The Driftless Area ecoregion is characterized by rolling, older loess covered plains with row crops and some pasture (USEPA 2015).

According to MNDNR Ecological Classification System (ECS), the Route A route width study area is located within the Eastern Broadleaf Forest Province, a transition zone between the western prairies and eastern mixed conifer/deciduous forest (MNDNR 2018). This Province is further divided into Sections and Subsections. The western half of the Route A route width study area is within the Minnesota and Northeast Iowa Morainal Section (222M), characterized by deciduous forest, woodland, and prairie in a hummocky morainal landscape, and the Oak Savanna Subsection (222Me), which was historically covered by bur oak savanna, patches of tallgrass prairie, and maple-basswood forest on gently rolling hills. The eastern half of the Route A route width study area is within the Paleozoic Plateau Section (222L), characterized by highly eroded bluffs and valleys, and the Rochester Plateau Subsection (222Lf), an area of transition from rolling plateau to dissected landscapes (MNDNR 2018).

Predominant features along Route A include rural residences, cropland, the G. McNeilus Wind Farm, Welsh Equipment, Inc., several snowmobile trails, Salem Creek – North Fork, Cascade Creek, several MNDNR public watercourse crossings, existing powerlines, and three sites of Biodiversity Significance: Canisteo 23, Canisteo 19, and Ashland 21-22. Approximately 3.3 miles of Route A parallel existing transmission lines. Though not within the Route A route width study area, a WMA and several protected areas are found just outside the boundary in the general vicinity of Salem Creek.

5.2 Land Cover

Land use, vegetative cover, and land form classification in Minnesota follows the National Hierarchical Framework of Ecological Units (McNab and Avers 1994). Ecological land classifications are used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features. The Route A route width study area occurs within the Rochester Plateau and Oak Savannah Subsections of the Eastern Broadleaf Forest Province.

Historically, the dominant vegetative communities within these Subsections were tallgrass prairie and bur oak savanna; however, the majority of this area is now heavily farmed. Tallgrass prairies are identified by the presence of native grasses such as little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), Indiangrass (*Sorgastrum nutans*), and switchgrass (*Panicum virgatum*), as well as an assortment of herbaceous forbs. Oak savannas are identified by a low density of canopy cover, usually less than 50%. Common vegetation associated with bur oak savannas include bur oak (*Quercus macrocarpa*), big bluestem, switchgrass, Indiangrass, and numerous forbs. The dominant land cover encompassed by the Route A ROW is cultivated crops, most notably corn varieties (*Zea mays*) and soybean (*Glycine max*). Pasture grasses, such as alfalfa (*Medicago sativa*) and winter wheat (*Triticum aestivum*), account for a smaller percentage of the land cover.

In addition, Minnesota has classified 39 distinct agroecoregions, based on a specific combination of soil type, landscape, climatic features, and land use. Agroecoregions are landscape units with relatively uniform crop productivity, climate, geologic parent material, soil drainage, and slope characteristics. The Route A route width study area is encompassed by the Level Plains, Undulating Plains, and the Rochester Plateau agroecoregions (University of Minnesota and MDA 1998). The Level Plain agroecoregion is comprised of fine-textured, poorly drained soils with row crop production on relatively flat topography. The Undulating Plains agroecoregion is comprised of well-drained, fine-textured soils developed on moderately steep slopes with a mixture of row crops and livestock/dairy production. The Rochester Plateau agroecoregion is composed of well-drained, fine-textured loessial soils developed on moderately steep slopes in karst with a mixture of row crops and livestock/dairy production.

The 2011 National Land Cover Database – Land Use-Land Cover dataset (Homer et al. 2015) indicates that the dominant land use-land cover types within the Route A ROW are: Cultivated Crops; Developed, Open Space; Herbaceous Areas; and Developed, Low Intensity. **Table 9** presents the total acreage of each land use-land cover type encompassed by the Route A ROW. Refer to **Map 1 (National Land Cover Database Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing land cover for Route A.

Table 9: Land Cover Along Route A

Route A Impacts	Total
Route Length (miles)	21.41
150-foot ROW (acres)	333.47
Land Cover	
Cultivated Crops in ROW (acres)	238.76
Percent Cultivated Crops in ROW	71.60%
Hay/Pasture Areas in ROW (acres)	12.49
Herbaceous Areas in ROW (acres)	14.94
Deciduous Forest Areas in ROW (acres)	2.30
Developed, Open Space Areas in ROW (acres)	46.49
Developed, Low Intensity Areas in ROW (acres)	14.94
Developed, Medium Intensity Areas in ROW (acres)	3.55

Impacts and Mitigation

The dominant land cover within the Route A ROW is Cultivated Crops, totaling approximately 238.76 acres out of a total of 333.47 acres (71.6%). An additional 12.49 acres of agricultural land exists as hay/pasture cover type (3.75%) No direct effect on Conservation Reserve Enhancement Program (CREP) parcels are anticipated as none were identified within the Cultivated Crops land cover. Digital data for Conservation Reserve Program (CRP) lands were unavailable at the time of this writing. CRP and CREP lands are administered by the U.S. Department of Agriculture (USDA) Farm Service Agency.

Short and long-term effects on land that is used for agricultural crop production will largely remain unchanged as crops will be able to be planted up to the generation tie line. The Applicant will coordinate with the landowners on the timing of clearing and construction activities to minimize adverse effects on the timing and planting of crops. Changes in agricultural equipment maneuvering routes adjacent to the generation tie line and associated structures will be required, but should have a nominal effect on overall production.

5.3 Soils

The Digital General Soil Map of the United States (STATSGO2) is a broad-based inventory of soils and non-soil areas that occur in a repeatable sequence across the landscape (NRCS 2018). These soil associations have been mapped at a scale of 1:250,000 in the continental U.S. The dominant soil associations within the Route A route width study area include Skyberg-Maxfield-Kasson, Skyberg-Maxfield-Clyde, Readlyn-Racine-Maxfield-Kasson, Ostrander-Maxfield-Kenyon, Racine-Maxfield-Floyd, Otter-Mt. Carroll-Joy, Rockton-Channahon-Atkinson, Waukee-Spillville-Radford-Lawler, and Port Bryon-Garwin. All soil associations have been assigned a Capability Class, which are categories of soils generally grouped by limitations and restrictions on their use. Soil associations occurring within the Route A route width study area have been assigned Capability Classes ranging from 1 to 7. Capability Class 1 indicates that the soils have few limitations restricting their use and Capability Class 7 indicates the soils have very severe limitations which make them unsuitable for cultivation and that restrict their functional use mainly to grazing, forestland, and wildlife habitat. Most of the Route A route width study area includes Capability Classes 1 and 2, indicating that there are few to moderate limitations that reduce the choice of plants or require moderate conservation practices (USDA 2018). Refer to **Map 2 (Soils Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing soil associations throughout Route A.

According to the general soil data for Dodge and Olmsted Counties (USDA 2018), the dominant soil series found within the Route A ROW are considered to be silty, silty clay loam, or loam, are used for agricultural purposes, and are well to poorly drained. The majority of the Route A ROW is classified as Prime Farmland, Prime Farmland if drained, or Farmland of Statewide Importance according to the soil surveys. Refer to **Table 10** for additional information regarding farmland classifications within the Route A ROW. Refer to **Map 3 (Prime Farmland Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing farmland classifications along Route A.

Table 10: Farmland Classifications Along Route A

Route A	Total
ROW Acres	333.47
Prime Farmland within ROW (acres)	214.06
Percent of ROW that Crosses Prime Farmland	64.19%
Prime Farmland if Drained within ROW (acres)	96.47
Percent of ROW that Crosses Prime Farmland if Drained	28.93%

Route A	Total
Farmland of State Importance within ROW (acres)	12.19
Percent of ROW that Crosses Farmland of State Importance	3.66%
ROW Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance, Prime Farmland if Protected from Flooding (acres)	322.72
ROW Percent Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance, Prime Farmland if Protected from Flooding	96.78%
Not Prime Farmland (acres)	10.75
Percent Not Prime Farm Land	3.22%

Impacts and Mitigation

The Route A ROW will cross 322.72 acres of farmland classified as Prime Farmland, Prime Farmland if drained, and/or Farmland of Statewide Importance. Additionally, according to the 2011 National Land Cover Database, the Route A ROW crosses approximately 251 acres of agricultural land (refer to **Section 5.2**). As such, a portion of prime farmland will be taken out of agricultural production due to the development of Route A. However, the impacts will not have a meaningful impact on total prime farmland within the state of Minnesota. Soil compaction and localized soil erosion may occur during the clearing and construction of the Route A ROW. In addition, potential soil impacts may result from the excavation, stockpiling, and redistribution of soils. Impacts would be short-term and minor in nature and would be mitigated through the proper use and installation of BMP, such as minimizing the number of vehicles and protection and maintenance of topsoil, during ROW clearing and generation tie line construction. Landowners will be compensated accordingly for any localized soil compaction or erosion that may occur. Refer to **Section 5.6** for additional information related to agricultural impacts.

5.4 Linear Feature Sharing

Linear corridor feature sharing is used to minimize natural resource disturbances to the adjoining landscape, which reduces the overall impacts of a linear feature. The proposed Route A alignment parallels existing transmission lines, roadways, and field lines to the greatest extent possible, while also addressing other site specific resource and landowner issues. Of the 21.4 miles of proposed Project, 16.2 miles (75.7%) follow linear features. Existing linear overhead transmission features within the Route A route width study area include two Northern States Power 345-kV transmission lines (Byron to Pleasant Valley and Byron to North Rochester); two

SMMPA 161-kV transmission lines (Al Corn to Byron and Cascade Creek to Byron); the Rochester Department of Public Utilities Byron to Maple Leaf 161-kV transmission line; and the SMMPA Byron to Kasson 69-kV transmission line. Route A contains Minnesota State Highway 56 as well as smaller county and local roads.

As currently planned, the Route A alignment would parallel approximately 3.2 miles of existing transmission lines, share approximately 9.4 miles of road ROW, and parallel approximately 3.7 miles of field lines (See **Table 11**).

Table 11: Linear Feature Sharing for Route A

Linear Feature Sharing – Type	Total
Length along Existing Transmission Alignment (miles)	**3.2**
also along roads (miles)	0
also along field lines (miles)	0
Length Not Along Existing Transmission Alignment (miles)	**18.2**
but along roads (miles)	9.4
but along field lines (miles)	3.7
No Linear Feature Sharing (miles)	5.2
Total Linear Feature Sharing (miles)	16.2
Total Linear Feature Sharing (percent)	75.7%

Impacts and Mitigation

Opportunities for linear feature sharing have been utilized as much as practicable along the Route A alignment. The proposed Route A alignment is not expected to impact linear features.

5.5 Human Setting

5.5.1 Public Health and Safety

Emergency management response services within Route A are provided by the Dodge County Sheriff, Dodge County Emergency Management (DCEM) services, Olmsted County Sheriff, and Olmsted County Emergency Management Department (OEMD). Dodge and Olmsted counties have specific plans for preparedness, response, recovery, and mitigation, and work closely with local, state, and federal officials to educate, prepare for, respond to, and recover from disasters

and large scale emergencies. Emergency response centers are located nearby in the City of Rochester for Olmsted County and in the City of Mantorville for Dodge County, and dispatch all 911 calls for their respective counties, including fire, medical, and police emergencies. The Applicant will work closely with DCEM and OEMD to ensure adequate assignment of 911 addresses for coordination of emergency responses. Fire and police departments servicing Route A are a mix of local, county, and volunteer departments. Although hospitals and other medical facilities are not within the Route A route width study area, they can be found in the cities of Byron, Kasson, and Dodge Center, as well as world-class medical facilities are in nearby Rochester.

The Minnesota Statewide Communication Interoperability Plan (SCIP) was created to maximize interoperability between public safety/service agencies as part of the Department of Homeland Security requirements. The Minnesota SCIP has made significant progress towards enhancing emergency communication with the deployment of a statewide, standards-based communication system known as the Allied Radio Matrix for Emergency Response (ARMER) (Minnesota Department of Public Safety 2015). ARMER has over 300 tower sites scattered across Minnesota, six of which are located in the same counties as the Route A ROW. Dodge County has one tower located near Dodge Center, and Olmsted County has five towers: New Haven, Viola, Gugenheim, Rock Dell, and Pleasant Grove.

Impacts and Mitigation

Construction activities and the temporary increase in associated workers are not expected to adversely affect public health or emergency services due to the limited number of construction workers and short duration of activities. Project construction will require different worker skill sets for different aspects of project construction and installation. The specialized nature of the skill sets and short duration of construction activities would preclude any long-term worker relocation to the area. Construction activities may require additional resources for traffic control and law enforcement.

Route A is not expected to impact ARMER towers due to their distance from the Route A route width study area. The Applicant will coordinate with ARMER operators, as appropriate, to ensure operations and signal interference will not be impacted.

Route A will be designed in accordance with state, local, NESC, and DCW standards for ground clearance, crossing utilities clearance, building clearance, strength of materials, and ROW widths. DCW will ensure construction crews and/or contract crews will comply with local, state, and NESC standards regarding facility installation and standard construction practices. Further, Occupational Safety and Health Administration (OSHA) measures will be adhered to by construction, operations, and maintenance crews. DCW and industry safety procedures will be followed once Route A is installed and is in operation.

DCW will use industry standard protective measures to safeguard the public in the event of an accident. In the event of a structure or conductor falling to the ground, protective equipment would de-energize the generation tie line. Local residents would be contacted, as necessary, if nearby structures are subject to further protective measures. Should landowners identify safety concerns, DCW will investigate and take appropriate corrective action. Other safety concerns not identified by DCW, but raised by landowners, will be investigated and addressed. With these safeguards and protective mechanisms, no significant impacts to public health and safety are anticipated.

5.5.2 Commercial, Industrial, and Residential Land Use, Displacement

The proposed Route A ROW extends from the Project collector substation in western Dodge County eastward into Olmsted County, terminating at the Byron POI Substation. This region is rural in nature, with the dominant land use being agricultural crop and dairy production. Rural residences are scattered throughout the landscape (*see* **Table 12** and **Appendix C (Detailed Aerial Maps)**) with minimal commercial and industrial facilities, including the G. McNeilus Wind Farm and Welsh Equipment, Inc. in the western section of the Route A ROW.

The Dodge County 2001 Comprehensive Plan describes sustainable goals for the county's economic development. DCW understands that Dodge County is in the process of updating its Comprehensive Plan during 2018. The overall vision or focus of Dodge County citizens is a continued high quality of life for all residents of Dodge County with long term goals being citizen participation and cooperation, protecting and preserving agricultural land, rural tax reform, and job skills training that support public education and economic development, greater public investments in County infrastructure, livable community design as the County experiences further growth, conservation of natural resources, and sustainable development (Dodge County Planning Commission 2001).

The Rochester-Olmsted Planning Department provides planning and related services to the City of Rochester, Olmsted County, and smaller cities and townships within Olmsted County. The Olmsted County Planning Advisory Commission is currently in the process of updating the 2011 Olmsted County Land Use Plan.

There are no residences within 75 feet of the Route A alignment, four residences are located within 150 feet of the Route A alignment, and a total of 29 residences occur within 500 feet of the Route A alignment (See **Table 12** and **Appendix C (Detailed Aerial Maps)**). Smaller structures such as outbuildings, grain bins, machinery storage sheds, and/or livestock holding pens may be located within 500 feet of the Route A alignment. No displacement of residences will occur from the construction of Route A. Should the removal or relocation of non-residential buildings be a consideration, DCW will work with landowners on a case-by-case basis to come to a voluntary agreement on the removal of relocation.

Table 12: Proximity of Residences to Route A Alignment

Route A Impacts	Total
Residences within 0-75 feet of Route A Alignment	0
Residences within 76-150 feet of Route A Alignment	4
Residences within 151-300 feet of Route A Alignment	14
Residences within 301-500 feet of Route A Alignment	11
Total Residences	**29**
Density (homes/mile)	**1.35**

Impacts and Mitigation

DCW is committed to designing a project that comports with the overall goals of the communities to conserve farmland and natural resources, support economic and sustainable development, and provide a positive benefit to the citizens of Dodge and Olmsted counties. The Route A ROW would be compatible with the rural, agricultural character of the counties and the goals set forth in the respective county comprehensive plans. A more detailed analysis of agricultural impacts can be found in **Section 5.6.1**.

The Route A ROW is compatible with current zoning designations across Dodge and Olmsted counties. As a result, the Route A ROW is not anticipated to have any impact on planning and zoning within in these counties.

Existing linear features and residences were incorporated into the design of the Route A ROW in order to minimize impacts to commercial, industrial, and residential properties. No impacts to commercial or industrial development are expected as the Route A ROW is generally rural in character. Additionally, no residences are found within 75 feet of the Route A alignment. Therefore, displacement of residences is not anticipated along the Route A alignment.

5.5.3 Sound

There are several ways in which sound levels are measured and quantified. All of them use the logarithmic decibel (dB) scale. The decibel scale is logarithmic to accommodate the wide range of sound intensities found in the environment. A property of the decibel scale is that the sound pressure levels of two or more separate sounds are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a 3 dB increase (53 dB), which is equal to doubling the sound energy but not equal to doubling the decibel quantity (100 dB). Thus, every 3 dB change in sound level represents a doubling or halving of sound energy.

Relative to this characteristic, a change in sound level of less than 3 dB is imperceptible to the human ear. Another mathematical property of decibels is that if one source of sound is 10 dB (or more) louder than another source, then the total sound level is simply the sound level of the higher-level source. For example, a sound source at 60 dB plus another sound source at 47 dB is equal to 60 dB.

A sound level meter that is used to measure sound is a standardized instrument (American National Standards Institute 1983). It contains weighting networks (*e.g.*, A-, C-, Z-weightings) to adjust the frequency response of the instrument. Frequencies, reported in Hertz (Hz), are detailed characterizations of sounds, often addressed in musical terms as pitch or tone. The most commonly used weighting network is the A-weighting because it most closely approximates how the human ear responds to sound at various frequencies. The A-weighting network is the accepted scale used for community sound level measurements; therefore, sounds are frequently reported as detected with a sound level meter using this weighting. A-weighted sound levels emphasize middle frequency sounds (*i.e.*, middle pitched – around 1,000 Hz), and de-emphasize low and high frequency sounds. These sound levels are reported in decibels designated as A-weighted decibels (dBA). Sound pressure levels for some common indoor and outdoor environments are shown in **Table 13**.

Table 13: Decibel Levels of Common Noise Sources

Sound Pressure Level (dBA)	Noise Source
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic (at 15 meters)
70	Business Office
60	Conventional Speech
50	Library

Sound Pressure Level (dBA)	Noise Source
40	Bedroom
30	Secluded Woods
20	Whisper

Because the sounds in the environment vary with time, many different sound metrics may be used to quantify them. There are two typical methods used for describing variable sounds. These are exceedance levels and equivalent levels, both of which are derived from a large number of moment-to-moment A-weighted sound pressure level measurements. Exceedance levels are values from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. Exceedance levels are designated L_n, where n is a value (typically an integer between 1 and 99) in terms of percentage. Equivalent levels are designated L_{eq} and quantify a hypothetical steady sound that would have the same energy as the actual fluctuating sound observed.

Current sound sources in the Project vicinity include: vehicles on roadways, rustling vegetation, birds, insects, and farm equipment. The MPCA regulates and has set standards for sound levels based on land use activities. Noise Area Classifications (NAC) are set based on land use classifications of rural, industrial and commercial land uses. Each NAC has an assigned daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) limit for noise. Limits are expressed as the range of permissible dBA within an hour period. L_{50} is the dBA that may be exceeded 50% of the time within an hour (30 minutes) and L_{10} is the dBA that may be exceeded 10% of the time within an hour (6 minutes). These limits are identified in **Table 14**.

Table 14: MPCA State Noise Standards – Hourly A-Weighted Decibels

Land Use	Code	Day (7:00am-10:00pm)		Night (10:00pm-7:00am)	
		L_{10}	L_{50}	L_{10}	L_{50}
Residential	NAC-1	65	60	55	50
Commercial	NAC-2	70	65	70	65
Industrial	NAC-3	80	75	80	75

Construction may be audible at sensitive receptors (schools, churches, residences, and libraries) that are located in close proximity to the construction area. The Route A ROW passes through a mostly rural agricultural setting; however, there are 29 sensitive receptors (residences) located within 500 feet of the Route A alignment. None of these residences are located within the Route A ROW or 75 feet of the Route A alignment.

Impacts and Mitigation

Sound is generally not audible from a generation tie line at sensitive receptors during fair weather periods. During times of inclement weather (periods of rain, snow, fog, or ice) there may be some audible sound; however, the sound of the rainfall itself may mask any sound from the generation tie line. The sound is generally caused by corona, which is the partial electrical breakdown of the insulating properties of the air around the conductors of a generation tie line. Currently, high voltage generation tie line conductors are designed to prevent the creation of coronas under ideal weather conditions. The maximum sound, measured at five feet above ground, associated with Route A is calculated to be 48.2 dBA at 75 feet from the alignment. **Table 15** presents sound calculations for generation tie lines. Noise standards are regulated by the MPCA under Minn. R. Chapter 7030. The most stringent of these standards is a 50 dB limit for nighttime sound level.

Table 15: Noise Calculations

Operating Voltage	Structure Configuration	L_{50} Rain (dBA)		L_{50} Fair (dBA)	
		0’	75’	0’	75’
Nominal Voltage: 345 kV	Tan Delta	52.4	47.9	27.4	22.9
Maximum Operating Voltage: 379.5	Tan Vertical	51.5	48.2	26.5	23.2

Activities associated with the construction of the generation tie line and access roads may generate temporary sound that is audible at sensitive receptors. Typical construction equipment and activity sound levels are presented in **Table 16**.

Table 16: Range of Typical Construction Equipment Levels (dBA)

Generic Construction Equipment	Min. Noise at 50 feet	Max. Noise at 50 feet
Backhoes	74	92
Compacters (Rollers)	73	76
Compressors	73	86
Concrete Mixers	76	88
Cranes (Moveable)	70	94
Dozers	65	95
Front Loaders	77	96
Generators	71	83
Graders	72	91
Jack Hammers and Rock Drills	80	98
Pavers	85	87
Pumps	69	71
Scrapers	76	95
Tractors	77	95
Trucks	83	96

Source: (Federal Highway Administration; FHWA 2006)

Sounds associated with construction activities would be temporary and limited to times when construction activities are underway, typically during the daytime. Sounds associated with construction would occur temporarily along the Route A alignment at different locations and times as construction sequencing occurs. To alleviate any increased sound levels near sensitive receptors, DCW will adhere to the following sound control practices which are recommended to minimize construction sound levels and comply with Minnesota standards:

- Limit heavy equipment activity (*e.g.*, pile driving, drilling, and crane use) adjacent to residences or other sensitive receptors to the shortest possible period required to complete the work activity;

- Minimize construction equipment idling;
- Ensure that proper mufflers, intake silencers, and other noise reduction equipment are in place and in good working condition;
- Maintain construction equipment according to manufacturer's recommendations; and
- Where practical, locate stationary equipment such as compressors, generators, and welding machines away from sensitive receptors or behind barriers; and
- When possible, limit construction activities to day light hours.

The Project is anticipated to meet the MPCA state noise standards as all sensitive receptors are located greater than 75 feet from the Route A alignment, indicating the maximum sound to be less than 48.2 dBA at all sensitive receptors.

5.5.4 Radio, Television, Cellular Device, and GPS Interference

Several AM and FM radio stations can be listened to within the Route A route width study area, although no stations or towers are located within the Route A route width study area. Nearby AM tower call signs include KDHL, KQAQ, KOWZ, and KRFO. Nearby FM tower call signs include KRUE, K228DR, KCJL-LP, KWWK, K252DM, KOWZ-FM, KRCH, K280EC, KRFO-FM, K289AM, K292GU, and KBGY.

No digital or analog television towers are located within the Route A route width study area. There are approximately 34 television stations broadcasting within the region of the Route A route width study area from southeast Minnesota and northeast Iowa. Most of the stations within the region of the Route A route width study area are low power stations or translator stations and have limited range. There are six full power towers (call signs KXLT-TV, KSMQ-TV, KAAL, KIMT, KYIN, and KTTC) that potentially have reception within the Route A route width study area.

There are no cell towers located within the Route A route width study area. Multiple cell towers operated by Alltel, AT&T, Verizon, and New Cingular Wireless PCS exist within the region and likely provide cellular service near and within the Route A route width study area.

GPSs are commonly used for a variety of purposes including vehicle navigation (personal and commercial), aviation, and surveying. GPSs rely on a connection between satellites and a receiver (*e.g.*, cell phone, hand-held GPS, etc.) to spatially locate the end user. It is likely that a variety of GPSs are utilized throughout the Route A route width study area.

<u>Impacts and Mitigation</u>

Noise created by electric generation tie line coronas may impact local reception of radio and television signals. AM radio frequency interference is the most susceptible to interference from corona noise and is common immediately below a generation tie line while impacts to FM signals are more infrequent due to their operation outside of corona noise frequencies.

Television signals may be impacted when the receiver is behind a transmission structure (in a shadow) and is opposite the transmitter. If interference occurs due to the proposed Route A alignment, the Applicant will work with affected landowners to restore reception.

Harmful interference associated with cellular devices is not likely as cellular transitions or packet switching occurs when a cellular link becomes unavailable. Additionally, interference with GPS systems is not anticipated from the construction or operation of the Project, as GPS signals generally are not interrupted by corona produced noise (Silva and Olsen 2002).

5.5.5 Aesthetics

Aesthetic quality and appeal of a region generally derive from the terrain, natural features (*e.g.*, lakes, rivers, ponds, etc.), native flora, and cultural features that define the landscape. Individual observers will have differing opinions on the aesthetic appeal of a region and impacts that may alter the quality. Those likely to be viewing the proposed Project include permanent observers (residents) and temporary observers (motorists, tourists, or recreationalists passing by or using the area intermittently). Residents along the Route A ROW are expected to have a higher sensitivity to the potential aesthetic impacts than temporary observers as they will look at the Project more frequently than those individuals periodically passing through the area.

The Route A route width study area crosses through two Level 3 Ecoregions: the Western Corn Belt Plains Ecoregion and the Driftless Area Ecoregion. Primarily, the Route A route width study area is located in the Western Corn Belt ecoregion. The topography in this ecoregion is characterized by nearly level to gently rolling plains. Historically, the region was covered with tallgrass prairie, but today land cover is dominated by cropland and pasture. A small portion of the Route A route width study area lies in the Driftless Area Ecoregion. The varying topography of Driftless Area Ecoregion easily distinguishes it from the surrounding Ecoregions, as it consists of loess-capped plateaus, deeply dissected by streams. The major land uses in this Ecoregion are livestock and dairy farming (Omernik and Gallant 1988).

Viewsheds in the area are generally long and open with only small scattered areas where the view from a location would be blocked by vegetation, topography, or existing structures. The Route A route width study area viewshed currently includes farmsteads, OHE transmission and distribution lines, a railroad, and wind turbines. Snowmobile trails, discussed in further detail in **Section 5.5.8**, are present within the Route A route width study area. In addition, highways and county roads traverse the Route A route width study area as part of the man-made environment. Dominant natural features within the viewshed include North Fork Salem Creek and Cascade Creek, and their associated tributaries, floodplains, and wooded riparian areas.

<u>Impacts and Mitigation</u>

Those likely to be most impacted by the Project are the residents of Dodge and Olmsted counties and the recreationalists using the designated snowmobile trails. The proposed Project will alter

the visual appearance of the Route A route width study area by adding additional vertical and horizontal man-made structures to the existing landscape. The height of the proposed transmission structures will be dependent on the terrain and span length. Transmission structures will be installed at the shortest height possible while maintaining all possible clearances. The proposed Project will not create a new feature type within the landscape as existing OHE transmission and distribution lines are present within the landscape surrounding the Route A alignment. The Route A alignment currently parallels existing OHE generation tie line ROWs for approximately 3.2 miles and crosses through an existing wind farm. Siting the generation tie line in the vicinity of other generation tie lines and wind farms will reduce the amount of new visual impacts. The Applicant sited the Project in coordination with landowners to minimize visual impacts, address aesthetics, and to utilize natural screening to provide a buffer between the infrastructure and observers, where feasible.

5.5.6 Socioeconomic

Socioeconomic data was gathered for Ripley, Ashland, Canisteo, and Mantorville townships in Dodge County and for Salem Township, Kalmar Township, and Byron City in Olmsted County to ascertain the estimated socioeconomic conditions present within the Route A route width study area. Data was also acquired for Dodge County, Olmsted County, and the State of Minnesota for comparison. The socioeconomic data was gathered from the U.S. Census Bureau 2016 population estimates and the 2012-2016 American Community Survey 5-Year Estimates. Although 2017 population estimates are available, the 2016 population estimate was used to correlate with the 2012-2016 American Community Survey 5-year estimates available for the median household, unemployment rate, and poverty rate data.

According to the U.S. Census Bureau 2016 population estimates, the total population of the townships and city through which the Route A route width study area extends is approximately 10,758 people. This accounts for approximately 0.20% of the total population of the state of Minnesota. Of these 10,758 individuals, approximately 99% are Caucasian with total minorities accounting for approximately 3% (U.S. Census Bureau 2018). Refer to **Table 17** below detailing additional population characteristics.

Table 17: Population Characteristics – Route A

Location	Total Population[1]	Caucasian[1]	Black or African American[1]*	Asian[1]	Other[1]	Hispanic[1]	Total Minority
Route A[2]	10,758	99.3%	0.3%	0.3%	0.8%	1.4%	2.8%
Dodge County	20,361	97.7%	1.2%	1.0%	1.6%	4.9%	8.7%
Olmsted County	150,104	87.4%	6.3%	6.8%	1.8%	4.6%	19.5%
State	5,450,868	86.8%	6.9%	5.3%	3.9%	5.1%	21.2%

[1]Source: U.S. Census Bureau 2012-2016 American Community Survey 5-Year Estimates (U.S. Census Bureau 2018) .
[2]Includes Ripley, Ashland, Mantorville, and Canisteo townships in Dodge County and Salem Township, Kalmar Township, and the City of Byron in Olmsted County.

According to the 2012-2016 American Community Survey 5-Year Estimates, the median household income for the counties, townships, and city along the Route A route width study area are higher than the state average of $63,217, with a range of $64,792 to $109,722. In addition, unemployment rates and the percent below poverty are generally better within the counties, townships, and city along the Route A route width study area than the state averages of 4.8% and 10.8%, respectively (U.S. Census Bureau 2018). Refer to **Table 18**, below, for additional information regarding economic characteristics.

Table 18: Economic Characteristics – Route A

Location	Median Household Income[1]	Unemployment Rate[1]	Percent of Population Below Poverty[1]
Dodge County	$68,718	3.3%	6.6%
Ripley Township	$64,792	10.3%	7.4%
Ashland Township	$82,500	2.0%	0.0%
Canisteo Township	$89,167	2.2%	0.3%
Mantorville Township	$109,722	2.3%	1.6%

Location	Median Household Income[1]	Unemployment Rate[1]	Percent of Population Below Poverty[1]
Olmsted County	$69,308	4.2%	9.2%
Salem Township	$78,700	1.7%	2.9%
Kalmar Township	$95,000	7.3%	4.6%
City of Byron	$82,109	1.9%	3.0%
Minnesota	$63,217	4.8%	10.8%

[1]Source: U.S. Census Bureau 2012-2016 American Community Survey 5-Year Estimates (U.S. Census Bureau 2018).

According to the American Community Survey (ACS) 2012-2016 estimates, educational services, health care, and social assistance accounted for 24.8% of jobs in Minnesota, followed by manufacturing at 13.5% and retail trade at 11.2%. For Dodge County, educational services, health care and social assistance accounted for 32.5% of followed by manufacturing at 14.0% and retail trade at 8.9%. Olmsted County primarily consists of educational services, health care and social assistance jobs, which accounted for 45.3% of Olmsted County (likely related to the Mayo Clinic located in Rochester), followed by retail trade at 10.7%, and manufacturing at 8.4% (U.S. Census Bureau 2018).

Impacts and Mitigation

Construction of the Project is not anticipated to significantly impact the permanent population size or demographics of the counties, townships, or city that the Route A route width study area traverses as the Project will not create any permanent jobs. However, the population size and demographics may temporarily increase and change with the addition of construction personnel. During construction, approximately 30-40 temporary construction personnel will be required. Most, if not all, of these temporary construction personnel will likely be from outside of the region and only remain in Dodge and Olmsted counties over the duration of the Project (approximately 5 – 7 months). This temporary increase in population is likely to result in a small financial gain for the local economy, as the Project and its personnel will utilize products and services from a variety of local businesses, including infrastructure maintenance services, industrial supplies, and hospitality services. No additional socioeconomic impacts are anticipated through the development of the Project.

5.5.7 Cultural Values

The cultural values associated with the Route A route width study area are likely related to the agriculturally dominated landscape. It can be assumed that the protection of land to allow for the

continuation of farming for local residents is of the utmost importance in Dodge and Olmsted counties. This is supported by the Dodge County Board Mission Statement: "To efficiently operate within a budget while providing excellent service, maintaining a rural character, and preparing the county to operate effectively for years to come." (Dodge County Board 2013).

Impacts and Mitigation

Cultural values are not expected to be impacted by the construction of the Project. The Project will not alter the rural character of the Route A route width study area nor will it substantially influence the continuation of farming for local residents. With only a small amount of land to be taken out of agricultural production (approximately 6 feet-12 feet diameter), landowners may continue to plant crops and graze livestock near the generation tie line structures. Farming activities may be temporarily impacted during the construction of the Project, but the Applicant will work closely with each landowner to ensure these impacts are minimized and appropriately mitigated.

5.5.8 Recreation

Dodge and Olmsted counties provide a variety of recreational opportunities including hiking, fishing, hunting, camping, nature viewing, and snowmobiling. Dodge County operates four traditional recreational parks and one campsite at Creek Park. In addition, Dodge County owns and maintains 4.6 miles of hiking trails and the Wasioja Seminary Park, a historic site. Olmsted County offers two camping locations, several parks, Oxbow Park & Zollman Zoo, and extensive miles of both hiking and skiing trails.

None of the aforementioned parks, campsites, hiking trails, or wildlife areas are located within the Route A route width study area. However, two designated snowmobile trails occur within the Route A ROW and study area, the Kasson-Mantorville Trails and the Dodge County Trails. The Kasson-Mantorville Trails cross the Route A ROW at eight locations and the Dodge County Trails cross the Route A ROW at one location. Two MNDNR WMAs (Bud Jensen WMA and Tri-cooperative WMA) are located within one mile of the Route A route width study area. These WMAs are publically accessible areas that provide good opportunities for wildlife observation and hunting (MNDNR 2018). A map showing the relationship of Route A to recreational uses is included as **Map 4 (Public Land Ownership and Recreation Map)** in **Appendix H (Environmental Feature Maps)**.

Impacts and Mitigation

Route A could impact hunting on private property and snowmobiling activities on the Kasson-Mantorville Trails and Dodge County Trails. Construction sounds and equipment may temporarily relocate wildlife from an area, negatively impacting viable hunting locations. Construction sounds and equipment may also temporarily diminish the aesthetic quality and scenery of the snowmobile trails. The Project may also require the temporarily closing or

relocating of part of the snowmobile trails or cutting off access to hunting locations to ensure the safety of construction personnel and recreationalists during construction activities. These aforementioned impacts will be temporary as they should only occur during the construction of the Project. The Applicant has initiated coordination with the snowmobile clubs and will continue to coordinate with the clubs regarding the placement of pole structures in the vicinity of the trails and construction timing. Following the construction of the Project, the construction equipment will be removed and wildlife should return as normal. However, recreationalists using the snowmobile trails may be impacted by the change in aesthetics when they are in proximity to the generation tie line.

5.5.9 Public Services

Emergency services, water and wastewater services, schools districts, electric utilities, and other public services and facilities are located in or near the Route A route width study area. These public services and infrastructure are discussed in more detail below.

(a) *Police, Fire, and Ambulance Services*

Emergency response services within the Route A route width study area are provided by local law enforcement and emergency response agencies located in nearby communities. Within the Route A route width study area, law enforcement will likely be provided by the Dodge County Sheriff, Olmsted County Sheriff, and the Byron Police department. Additional assistance may be provided by other local municipal police departments. Within Dodge and Olmsted counties, there are several fire departments and ambulance providers to support emergencies within the Route A route width study area.

(b) *Hospitals*

Several hospitals and medical facilities are available within Dodge and Olmsted counties including the Kasson Mayo Family Practice Center, Field Crest Care Center, Hayfield Spine Care Center, Olmsted Medical Center-Byron, and the Mayo Clinic and associated branches. However, hospitals and other medical facilities are not located within or near the Route A route width study area.

(c) *Water and Wastewater Services*

Within the Route A route width study area, water and wastewater services are expected to be provided through privately-owned water wells and septic systems. Municipal water and sewer are likely present within the small portion of the Route A route width study area that crosses the City of Byron.

(d) *School Districts*

The Route A route width study area includes two school districts within Dodge County (Kasson-Mantorville and Triton) and one school district within Olmsted County (Byron). However, none of the school buildings are located within the Route A route width study area.

(e) *Electric Utilities*

Northern States Power, SMMPA, and the Rochester Department of Public Utilities provide electricity within the Route A route width study area. Distribution and transmission infrastructure of these electric providers are present within and near the Route A route width study area. The Applicant will work with the appropriate utility company, as necessary, to avoid potential impacts to electric utility infrastructure.

Electricity is also provided for the region through wind generation facilities. The Route A route width study area includes one small wind farm owned by Garwin McNeilus, located east of State Highway 56 and north of County Road 6. Additionally, other wind farms may currently be proposed for construction or may begin construction following submittal of this Application.

(f) *Other Public Services*

There are a wide variety of other public services provided in the area by Dodge County, Olmsted County, and the City of Byron. These services include environmental services, administrative services, planning and zoning department services, economic development organizations, veteran service offices, among many others. County and city departments throughout the communities spanning the Route A route width study area assist with snow removal, street maintenance, stormwater management, building maintenance, and sidewalks. Additionally, there are no pipelines within the Route A route width study area.

Impacts and Mitigation

Public services within the Route A route width study area are not anticipated to be permanently or significantly impacted by the construction and operation of the Project. The Applicant will work with other wind generation providers to ensure the Project will not impact any of the existing wind farms or those under construction, as appropriate. The Applicants will also utilize the Gopher State One-Call system to locate and mark all existing underground utilities prior to construction to avoid impacts on pipelines. Construction of the Project may require road closures for the safety of public and construction personnel. Road closures may temporarily impact the travel of public services, specifically emergency response services. Prior to construction, the Applicant will notify the appropriate local emergency services near the Project to minimize any potential impacts caused by the construction of the Project.

Construction of the project will also temporarily increase the population and workforce present within the vicinity of the Project. This increase in population may temporarily cause an increase

in individuals requesting the use of public services or requiring assistance from emergency services. However, this minimal increase in population should not create the need for more public services than already exist. Therefore, impacts associated with a temporary increase in population are not anticipated.

In addition, the construction and operation of the Project is not anticipated to impact public infrastructure. The Applicant will work with public service providers to determine the location of public infrastructure to ensure impacts are avoided. The Applicant will coordinate with individual landowners to ensure the Project does not impact privately-owned septic systems and water wells, and with the Byron Public Works to ensure municipal services are not impacted, as appropriate.

5.5.10 Transportation

(a) *Roadways*

Existing road infrastructure within the Route A route width study area primarily consists of paved and unpaved county and township roads that typically follow section lines. Unpaved two-track roads, likely used for farming and private access, are also present within the Route A route width study area. The two largest roadways within the Route A route width study area are U.S. Highway 14 and State Highway 56. U.S. Highway 14 is located near the eastern terminus, approximately 0.4-mile south of the Byron POI Substation and State Highway 56 is located approximately 5.4 miles east of the Project collector substation (refer to **Appendix B (County-Level Maps**).

The MN/DOT Average Annual Daily Traffic (AADT) data can be used to determine traffic volumes within and around the Route A route width study area. Data was not available for all of the roads within the Route A route width study area and thus, only roads with data available are discussed further. Dodge County (U.S. Highway 14) has the highest AADT count with 17,200 vehicles per day, using 2015 data, while the lowest count was at CSAH 8 (670th St) with 110 vehicles per day, using 2013 data. The remainder of roads within the Route A route width study area contained traffic counts between 145 and 2,750 vehicles per day (MN/DOT 2015). Generally, traffic counts within the Route A route width study area are relatively low with a few main thoroughfares conveying most of the traffic. Due to the rural setting of the Route A route with study area, roads lacking AADT data likely also carry low traffic levels. Additional information regarding AADT data for the roads within the Route A route width area is included in **Table 19** below.

Table 19: Annual Average Daily Traffic (AADT) on County, State and US Highways, Roads, and Interstates Crossed or Paralleled by Route A

Road	County	AADT*	Traffic Count Year	Distance Paralleled[1] (miles)
140th Ave	Dodge	Not Available	Not Available	--
150th Ave	Dodge	Not Available	Not Available	--
CR W (670th St)	Dodge	40	2013	3.78
CSAH 5 (160th Ave)	Dodge	280	2013	--
170th Ave	Dodge	Not Available	Not Available	--
180th Ave	Dodge	Not Available	Not Available	--
State Highway 56	Dodge	2,750	2015	1.03
CSAH 6 (680th St)	Dodge	145	2013	3.01
200th Ave	Dodge	Not Available	Not Available	--
210th Ave	Dodge	Not Available	Not Available	--
CSAH 9 (220th Ave)	Dodge	1,000	2013	0.49
230th Ave	Dodge	Not Available	Not Available	--
240th Ave	Dodge	Not Available	Not Available	--
CSAH 13 (250th Ave)	Dodge	1,100	2013	--

Road	County	AADT*	Traffic Count Year	Distance Paralleled[1] (miles)
CSAH 8 (670th St)	Dodge	110	2013	0.96
CSAH 15 (270th Ave)	Dodge	750	2013	--
CSAH 25 (280th/ County Road 25 SW)	Dodge/ Olmsted	370	2014	--
15th St SW	Olmsted	Not Available	Not Available	--
10th St SW	Olmsted	Not Available	Not Available	--
Frontier Rd SW	Olmsted	Not Available	Not Available	--
U.S. Highway 14	Olmsted	17,200	2015	--
MSAS 101 (Frontage Rd NW)	Olmsted	1,750	2014	--
4th St NW	Olmsted	Not Available	Not Available	0.11

Source: MN/DOT AADT GIS Shapefile (MN/DOT 2015).

[1] "--"Indicates road is crossed and not paralleled by the Route A ROW.

(b) *Railroads*

There is one active railroad within the Route A route width study area, near the eastern terminus of the Route A alignment and it is owned by DM&E. The Route A alignment would cross the DM&E railroad approximately 0.2 mile southwest of the Byron POI Substation (refer to **Appendix B (County-Level Maps)**).

(c) *Airports and Airstrips*

The Route A alignment is south of TOB by approximately 2.4 nautical miles of the nearest runway end. At this proximity, and based on a maximum transmission structure height of 135 feet above ground level (agl), it is expected that many structures in Route A would require filing

a Form 7460-1, Notice of Proposed Construction or Alteration (notice) to the FAA prior to construction. This process allows the FAA to determine the effect a structure could have to the safe and efficient use of navigable airspace. The FAA applies different sloping and horizontal obstacle identification surfaces (OIS) to all public use airports as part of their aeronautical study. When a structure penetrates an OIS, the FAA conducts further study to determine the level of adverse effect from the structure and if a determination of hazard would be warranted. A structure that has little or no effect to the navigable airspace would be issued a determination of no hazard, which is considered a favorable determination. Maps of airports and other aviation facilities near the Project are included in **Appendix I (Maps of Airports, Private Air Strips, Heliports, and Navigational Aids)**.

To facilitate route selection and structure design, DCW conducted its own internal aeronautical evaluation. To assist in this evaluation DCW contracted Capital Airspace Group to study the general Project Study Area using the same obstruction evaluation process used by the FAA to identify areas where structures could be restricted below 135 feet agl. The outcomes of the Capital Airspace Group study is included with this Application as **Appendix J (Obstruction Evaluation and Airspace Analysis)**. The project area defined by Capital Airspace Group includes Route A, but also includes large areas closer to TOB than Route A.

A portion of the Route A alignment crosses through two OIS associated with TOB; a Category C Circling Approach Surface (Cat. C area) and the extreme outer edge of the Conical Surface. The Cat. C area obstacle identification surface has an OIS elevation of 1660 feet above mean sea level (amsl). The ground elevation (USGS topographic maps) where Route A crosses the Cat. C area ranges from 1250 feet to 1330 feet amsl. Based on this range of elevations, the 135 feet agl structure proposed by DCW would not penetrate the Cat. C OIS. In the location where the Route A alignment crosses the Conical surface, the OIS is approximately 1650 feet amsl. With the ground elevation in this area being approximately 1310 feet amsl, the 135 feet agl structure proposed by DCW would not penetrate the OIS.

The Capital Airspace Group study noted a potential new runway with instrument procedure proposed for TOB. This runway would affect the western end of the Route A alignment. However, the area identified by Capital Airspace Group as the likely instrument approach area already contains wind turbines that are greater than 300 feet agl. The OIS for an instrument procedure in this area would have to take the existing wind turbines into account as the controlling obstacle, and thus the 135 feet agl structure proposed by DCW would not likely conflict with this surface.

Impacts and Mitigation

(a) *Roadways*

Construction of the Project is not anticipated to have permanent impacts on roadways or traffic within the Route A route width study area. However, the Project will likely result in temporary impacts including road and lane closures and an increase in traffic congestion. Temporary road and lane closures will be necessary to safely and efficiently install the generation tie line across roadways, as necessary. Road and lane closures may cause delays, but most crossings will be able to be completed within 24-48 hours. Once the generation tie line has been installed near a road or lane closure, the road and/or lanes would be re-opened and traffic flow would resume as normal. Most of the roads within the Route A width route study area have minimal daily traffic, and road and/or lane closures should not have significant impacts on local traffic. There may be some traffic impacts at the crossings of U.S. Highway 14 and State Highway 56.

The Project will temporarily increase traffic congestion within the Route A route width study area and surrounding areas. However, due to the rural setting and generally low traffic present within a majority of the Route A route width study area, this temporary increase is not anticipated to have a significant impact on local traffic.

Construction and installation of utility lines within road ROW will require permits from the appropriate regulatory agencies. Refer to **Section 7.4** for additional information.

(b) *Railroads*

The Applicant will coordinate with DM&E in order to acquire the appropriate crossing permits and to ensure the safety of all construction and railway personnel.

(c) *Airports and Airstrips*

The study conducted by Capital Airspace Group identified areas within a larger study area where structures heights of 135 feet would be restricted by overlying obstruction surfaces. However, Route A does not cross through the most restrictive areas identified and the maximum structure height being proposed is 115 feet agl. Therefore, no impacts to TOB are anticipated as a result of Route A. Following final structure design and siting, DCW will identify and file all structures that require notice to the FAA. Based on DCW's internal review, no obstruction issues are expected to result from the FAA aeronautical study.

5.5.11 Electric and Magnetic Fields

Extensive research has been conducted over the past three decades to evaluate whether exposure to extremely low frequency electric fields (ELF-EFs) and extremely low frequency magnetic fields (ELF-MFs) cause biological responses and health effects. Epidemiological and toxicological studies have not shown statistically significant associations or have only shown

weak associations between ELF-MF exposure and health risks. Public health professionals have also investigated the possible impact of exposure to EFs and MFs upon human health for the past several decades. While the general consensus is that EFs pose no risk to humans, the question of whether exposure to MFs can cause biological responses or health effects continues to be debated.

In 2007, the World Health Organization (WHO) concluded a review of the health implications of MFs. In this report, the WHO stated:

> Uncertainties in the hazard assessment [of epidemiological studies] include the role that control selection bias and exposure misclassification might have on the observed relationship between magnetic fields and childhood leukemia. In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status. (*Environmental Health Criteria Volume No. 238 on Extremely Low Frequency Fields* at 12, WHO (2007)).

WHO did not recommend specific levels as an exposure limit but provided: "The best source of guidance for both exposure levels and the principles of scientific review are international guidelines." *Id*. at pp. 12-13. The international guidelines referred to by WHO are the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the IEEE exposure limit guidelines to protect against acute effects. *Id*. at 12. The ICNIRP-1998 continuous general public exposure guideline, the exposure limit published at the time of the WHO's review, is 833 mG and the IEEE continuous general public exposure guideline in 9,040 mG.

In 2010, ICNIRP revised its continuous general public exposure guideline by increasing it from 833 mG to 2,000 mG. The WHO has not provided any analysis of the ICNIRP-2010 continuous general public exposure guideline to date.

The Commission, based on a Minnesota Interagency Working Group report and the WHO findings, has found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects." *In the Matter of the Application for a HVTL Route Permit for the Tower Transmission Line Project*, Docket No. ET2, E015/TL-06-1624, Findings Of Fact, Conclusions Of Law And Order Issuing A Route Permit To Minnesota Power And Great River Energy For The Tower Transmission Line Project And Associated Facilities at p. 23 (Aug. 1, 2007).

This finding was recently confirmed in the Brookings County – Hampton 345 kV Route Permit proceeding (Brookings Project). In the Brookings Project Route Permit proceeding, applicants and one of the intervening parties provided expert evidence and testimony on the potential

impacts of EFs and MFs on human health. The ALJ in that proceeding evaluated written submissions and a day-and-half of testimony from these two expert witnesses. The ALJ concluded:

> There is no demonstrated impact on human health and safety that is not adequately addressed by the existing State standards for [EF or MF] exposure.

In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota, Docket No. ET2/TL-08-1474, ALJ Findings Of Fact, Conclusions And Recommendation at Finding 216 (Apr. 22, 2010 and amended Apr. 30, 2010). The Commission adopted this finding when it granted a Route Permit for the Brookings Project. *In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Docket No. ET-2/TL-08-1474, Order Granting Route Permit at 12 (Sept. 14, 2010); and also in *In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Docket No. ET2/TL-08-1474, Findings Of Fact, Conclusions Of Law, And Order Issuing An HVTL Route Permit To Great River Energy And Xcel Energy For A 345 kV Transmission Line From Brookings County, South Dakota To Hampton, Minnesota at 1 and 8 (Sept. 14, 2010).

Impacts and Mitigation

No impacts to human health are anticipated as a result of the ELF-EFs and ELF-MFs from the Project. The Project will be designed to be ELF-EFs below 8 kV/m. Additionally, DCW will design the Project using unlike phasing of conductors to reduce ELF-MFs from those that would be observed if like phasing of conductors were used for the Project.

5.6 Land-Based Economies

5.6.1 Agriculture

Land use within the Route A route width study area is primarily agricultural and agriculture accounts for approximately 251 acres, or approximately 75% of the Route A ROW. According to the 2012 USDA Agricultural Census Report, over 80% of the land in Dodge County (roughly 225,418 acres) was used for agriculture on approximately 621 farms. Corn, soybeans, and wheat are the primary crops grown in Dodge County, while swine and cattle are the predominant livestock raised in the county. The total market value of agricultural products sold in the County for 2012 was approximately $288.1 million, with crop markets totaling approximately $177.6 million and livestock markets totaling approximately $110.5 million (USDA 2014; **Table 20**).

Agricultural land use within Olmsted County is less than Dodge County, at approximately 63% of the County. Roughly 264,407 acres were used for agriculture on approximately 1,150 farms in 2012, according to the USDA Agricultural Census Report. The total market value of agricultural products sold in the County in 2012 was approximately $293.05 million, with crop markets totaling approximately $164.4 million and livestock markets totaling approximately $85.6 million (USDA 2014; **Table 20**).

Table 20: Agriculture Statistics for Dodge and Olmsted Counties and the State

Location	Number of Farms	Average Farm Size (acres)	Land in Farms (acres)	Crop Sales	Livestock Sales
Dodge County	621	363	225,418	177,607,000	110,522,000
Olmsted County	1,150	230	264,407	164,449,000	85,644,000
Minnesota	**74,542**	**349**	**26,035,838**	**$13,879,211,000**	**$7,400,974,000**

Source: USDA 2012 Census of Agriculture County Summary Highlights.

Approximately 64.2% of the Route A ROW is classified as prime farmland, while 28.9% is classified as prime farmland if drained. Additionally, approximately 3.2% of land within the ROW is not classified as prime farmland and approximately 3.7% is considered farmland of statewide importance. **Table 21** summarizes the impacts to prime farmland for the Route A ROW and **Map 3 (Prime Farmland Map)** in **Appendix H (Environmental Feature Maps)** details farmland classifications along Route A.

Impacts and Mitigation

The Project is not expected to significantly impact agricultural land use or the general character of the area. The current design includes 187 pole structures within the Route A ROW. Each structure is anticipated to result in approximately 29 $feet^2$-113 $feet^2$ of impact (6feet-12feet diameter), resulting in an estimated 0.272 acre of total permanent impact from pole installation along the Route A ROW. Of these structures, approximately 112 are planned in land used as cultivated crops (approximately 0.163 acre of total impact) and three are planned in land designated as hay/pasture (approximately 0.004 acre of total impact). While a small amount of land per generation tie line structure will be taken out of agricultural production for each structure, landowners may continue to plant crops and graze livestock near the generation tie line structures. Final Project structure siting will include discussions with landowners to keep the footprint of each structure to a minimum and to identify agricultural infrastructure (*e.g.*, drain tiles) that should be avoided, or will need to be disturbed and subsequently repaired, on their property.

The use of feedlots is a common practice in raising livestock in the State of Minnesota. The MPCA administers rules regulating livestock feedlots in Minnesota. According to the MPCA's What's In My Neighborhood map search tool, there are 602 registered feedlots in Dodge County and 710 registered feedlots in Olmsted County. A total of 15 of the aforementioned registered feedlots are located within the Route A route width study area – 14 are located in Dodge County and one is located in Olmsted County (MPCA 2018). There is one registered feedlot within the Route A ROW located in Olmsted County. Livestock in pastureland may be temporarily disrupted during construction, but appropriate measures will be made to ensure fenced pastureland is secure. Temporary fencing may be put in place if fencing is impacted and will be repaired or replaced after construction.

Land that is used for agricultural production will largely remain unchanged. Short and long-term effects on agricultural land will be minimal. Crops will be able to be planted up to generation tie line structures. Changes in agricultural equipment maneuvering routes around transmission structures will be required in some areas, but should have a nominal effect on overall production. When construction occurs outside of winter months there is a higher possibility that minor temporary impacts could occur. Soil compaction, loss of planting opportunity, crop damage, and drain tile damage could occur due to construction throughout the entire 333-acre ROW. However, it is unlikely that impacts will occur to the entire ROW as temporary impacts will likely be limited to access areas, laydown areas, and stockpiling areas. Impacts that do occur are anticipated to be minor. The only farmland that will remain permanently altered will be land where generation tie line structures are erected and positioned.

After construction of the generation tie line structures is completed, all remaining land surrounding the structures can still be farmed. This negligible loss of agricultural land will not result in the loss of agricultural-related jobs or net loss of income.

The Applicant will coordinate with landowners to identify property features, such as terraces and drain tiles that need to be avoided during construction activities. Should incidental soil compaction occur as a result of temporary construction activities, appropriate measures will be taken to ensure farmland is restored in accordance with the lease agreement between the landowner and the Applicant. Refer to **Table 21**, below, for estimated impacts to land based economies.

Table 21: Impacts of Route A on Land Based Economies

Route A Impacts	Total
Cropland in ROW (acres)	238.76
ROW Percent Cropland	71.60%
Route A Length (miles)	21.41

Route A Impacts	Total
Route A route width study area (acres)	6,116.70
ROW (total acres)	333.47
Total Number of Poles	187
Estimated Permanent Impacts from Pole Installation (total acres)	0.272
Prime Farmland	
Prime Farmland within ROW (acres)	214.06
Percent of ROW that Crosses Prime Farmland	64.19%
Number of Poles in Prime Farmland	117
Estimated Impacts from Pole Installation to Prime Farmland (acres)	0.169
Prime Farmland if Drained within ROW (acres)	96.47
Percent of ROW that Crosses Prime Farmland if Drained	28.93%
Number of Poles in Prime Farmland if Drained	60
Estimated Impacts from Pole Installation to Prime Farmland (acres)	0.088
Farmland of State Importance within ROW (acres)	12.19
Percent of ROW that Crosses Farmland of State Importance	3.66%
Number of Poles in Farmland of State Importance	6
Estimated Impacts from Pole Installation to Farmland of State Importance (acres)	0.009
ROW Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance, and Prime Farmland if Protected from Flooding (acres)	322.72
ROW Percent Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance, Prime Farmland if Protected from Flooding	96.78%
Total Number of Poles in Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance, and Prime Farmland if Protected from Flooding	183

Route A Impacts	Total
Total Estimated Pole Impacts to Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance, and Prime Farmland if Protected from Flooding (acres)	0.266
Forestry	
Commercial Forestry Operations in Route A Route Width Study Area	0
Commercial Forestry Operations in ROW	0
Tourism	
Water Trails Crossed by ROW	0
Number of Snowmobile Trails in ROW	2
Number of Snowmobile Trail Crossings in ROW	9
Mining	
Mines within Route A Route Width Study Area	0
Mines within ROW	0

5.6.2 Forestry

There are no economically important forestry resources within the Route A route width study area (refer to **Table 21**). Most wooded areas within the Route A route width study area consist of shelterbelts or small woodlands surrounding active farmsteads or bordering streambanks. See **Map 1 (National Land Cover Database Map)** in **Appendix H (Environmental Feature Maps)** for details related to wooded areas along Route A.

Impacts and Mitigation

No impacts to economically important forestry resources are expected to occur; therefore, no mitigation will be necessary. If applicable, the Applicant will restore wooded areas in accordance with the lease agreement between the landowner and the Applicant.

5.6.3 Tourism

Dodge County offers tourism and recreational opportunities throughout the year. In 2016, annual leisure and hospitality expenditure in Dodge County was approximately $12,284,994, which equated to about 426 private tourism-related jobs in the County (Explore Minnesota 2018).

Generally, tourism in Dodge County focuses on promoting the area's parks, art, and hospitality facilities, as well as recreational activities. Local community events include the Dodge Center Harvest Fest, Mantorville Marigold Days, Zumbro Bend Rendezvous, Dodge County Relay for Life, Claremont Hog Fest, Festival in the Park, Dodge County Free Fair, and West Concord Survival Days.

Annual leisure and hospitality expenditure in Olmsted County in 2016 totaled approximately $487,499,455, which equated to about 8,725 private tourism-related jobs in the county (Explore Minnesota 2018). The City of Rochester offers such tourism draws as the Rochester Art Center Reptile and Oxbow Park, Zollman Zoo, and the Heritage House Victorian Museum, in addition to outdoor recreational activities.

There are no U.S. Fish and Wildlife Service (USFWS) Waterfowl Production Areas (WPAs), Minnesota Scientific and Natural Areas (SNAs), or Wetland Reserve Program (WRP) conservation easements within the Route A ROW or within one mile of the Route A route width study area. However, there are two WMAs within one mile of the Route A route width study area. These public resources provide recreational and tourism opportunities including biking, camping, wildlife watching, hunting, fishing, and snowmobiling (MNDNR 2012). As discussed in **Section 5.5.8** and included in **Table 21**, there are two snowmobile trails that bisect the Route A ROW (refer to **Map 4 (Public Land Ownership and Recreation Map)** in **Appendix H (Environmental Feature Maps)**).

Impacts and Mitigation

Generation tie line structures are expected to be located mostly on private lands, and, therefore, there will be relatively few direct impacts, if any, to existing recreational facilities and tourism activities. The Applicant has initiated coordination with the snowmobile clubs and will continue to coordinate with the clubs regarding the placement of pole structures in the vicinity of the trails and construction timing. Impacts to snowmobile trails will be mostly visual in nature. The Project structures are not anticipated to have a negative effect on area tourism. Since no negative impacts to tourism are anticipated, no mitigation will be necessary.

5.6.4 Mining

Based on review of MN/DOT County Pit Maps and MN/DOT Aggregate Source Information System (ASIS), there are no economically significant mining resources within the Route A route width study area (MN/DOT 2002, 2018; **Table 21**). According to current aerial imagery and the 7.5 Minute Series USGS topographic map for Hayfield, Minnesota (USGS 1966), a minor sand or gravel operation appears to occur within the Route A route width study area southwest of the intersection of 240th Avenue and 670th Street in Dodge County. This sand or gravel pit is located outside of the Route A ROW. Quarries, gravel, and sand pits exist throughout Dodge and Olmsted counties but are largely inactive, abandoned, or their use is limited to a private landowner.

Impacts and Mitigation

Project infrastructure will not be located within sand or gravel operations and the Project is not expected to impact the mining industry. As such, no mitigation will be necessary.

5.7 Archaeological and Historical Resources

The Project Area is located in the Southeast Riverine Archaeological Region. The Southwest Riverine Archaeological Region covers the southwestern most corner of Minnesota, including all of Dodge County and all of Olmsted County (Hudak et al. 2002). Archaeological resources are predominantly concentrated near wooded areas and along major river terrace systems; specifically, archaeological resources would be expected near water sources on terraces, bluffs, and hilltops. However, archaeological resources have been documented in a large variety of landforms within the region.

The SHPO and Minnesota Office of the State Archaeologist (OSA) were visited in May 2017, in February 2018, and again in March 2018 to gather cultural resources records related to the Route A route width study area. Cultural resources data maintained by the SHPO and OSA include NRHP records, Minnesota State Historic Sites Network (MSHSN) records, Minnesota State Monument (MSM) records, Minnesota State Register of Historic Places (MSRHP) records, "state site" or "state archaeological site" records, records related to previous professional architectural and archaeological surveys, and records related to reported architectural inventory resources and archaeological sites.

The literature review indicated there are currently 10 NRHP listings (sites, structures, properties or districts) in Dodge County and 25 NRHP listings in Olmsted County (National Park Service 2018). None of these NRHP listings are located within the Route A route width study area. Cultural resources listed on the MSHSN, MSM, and MSRHP are not located within the Route A route width study area. The Route A route width study area also does not contain previously recorded archaeological sites. The Route A route width study area contains four known architectural inventory resources (**Table 22**). The Route A alignment would not cross over Bridge No. L5500 (Site Number: DO-CAN-009) or the unnamed farmstead (Site Number: OL-SLM-014). The Route A alignment would cross over Trunk Hwy 56 (Site Number: XX-ROD-022) and U.S. Highway 14 (Site Numbers: XX-ROD-016 and OL-ROD-001). None of these four architectural inventory resources have been evaluated for listing on the NRHP. Refer to **Map 5 (Cultural Resources Map)** in **Appendix H (Environmental Feature Maps)**.

Table 22: Architectural Inventory Resources Within the Route A Route Width Study Area

Site Number	Site Name / Site Type	Site Significance
DO-CAN-009	Bridge No. L5500/ Bridge	Unevaluated
OL-SLM-014	Unnamed / Farmstead	Unevaluated
XX-ROD-016 and OL-ROD-001	U.S. Highway 14 – Byron to Rochester / Highway	Unevaluated
XX-ROD-022	State Hwy 56	Unevaluated

Impacts and Mitigation

While DCW implements an avoidance strategy for cultural resources, the proposed construction activities for the Project may have the potential to encounter unidentified archaeological sites. Should impacts to cultural resources that appear eligible for listing on NRHP be unavoidable, DCW will consult with the SHPO and/or OSA on whether or not the resource is eligible for listing on the NRHP. In addition, should DCW encounter unidentified archaeological sites during Project construction, DCW will follow an unanticipated discovery plan (UADP) to address any unanticipated discoveries of cultural resources, including archaeological sites and possible human remains. Further information concerning the UADP is discussed below.

Four known architectural inventory resources are located within the Route A route width study area. The Route A alignment would not cross over bridge No. L5500 or the unnamed farmstead listed in the architectural inventory, but would cross over architectural inventory resources, U.S. Highway 14, and State Highway 56. Examination of aerial imagery indicates these highways are currently traversed by existing distribution and transmission line routes. Therefore, indirect (*i.e.*, visual) impacts to these highways would not increase from the current impacts created by existing distribution/transmission line routes within the vicinity of Route A. Accordingly, direct and/or visual impacts are not anticipated to affect these architectural inventory resources.

Previously recorded archaeological resources are not located within the Route A route width study area. Therefore, impacts to previously recorded archaeological resources would not occur as a result of construction of the Route A alignment. A Phase I archaeological survey will be conducted within high probability areas of Route A prior to construction to identify and avoid unrecorded archaeological sites which may be present.

DCW will avoid impacts to any discovered significant archaeological or architectural resources to the extent practicable during all phases of the Project, including development micrositing, construction, and operation. Utilization of existing transmission line corridors reduces impacts to cultural resources compared to construction of new transmission line. Attempts were made to design the Route A alignment to utilize existing transmission line and utility corridors to the extent possible. If significant archaeological resources are identified during the Phase I

archaeological surveys, the integrity and significance of the resource(s) will be assessed in terms of the potential for NRHP eligibility. If the identified archaeological resource(s) are determined to be significant and cannot be avoided by the Project, further investigation and/or mitigation of the resource may be needed and will be coordinated with the SHPO and/or OSA. While avoidance of archaeological resources would be the preferred option, mitigation of impacts to NRHP-eligible archaeological resources may be necessary. The results of this additional investigation or mitigation will be described and documented on a case-by-case basis by compilation into a report, or reports, and shared with the SHPO and/or the OSA.

While there are no state regulations which require an UADP, DCW will prepare such a plan. Should Project construction and/or operation inadvertently encounter previously undocumented archaeological resources or human remains, the discoveries will be reported to the SHPO and/or OSA, as applicable. Should human remains be inadvertently discovered the UADP will address Minnesota's *Damages; Illegal Molestation of Human Remains; Burials; Cemeteries; Penalty; Authentication Statute* (MS 307.08), which protects known or suspected human burials and burial grounds regardless of land ownership status.

5.8 Natural Environment

5.8.1 Air Quality

The Clean Air Act (CAA) of 1970, 42 U.S.C. 7401 et seq., amended in 1977 and 1990, is the primary federal statute governing ambient air pollution. The CAA designates standards for the following criteria pollutants that have been determined to affect human health and the environment: particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), lead (Pb), and ozone (O_3). Volatile Organic Compounds (VOC) and NO_2 are precursors to O_3, which is not an emitted source but is formed by these pollutants in the atmosphere (40 Code of Federal Regulations Part 50). The EPA has developed National Ambient Air Quality Standards (NAAQS) for these criteria pollutants to protect public health and welfare. The MPCA has also established state standards (Minnesota Ambient Air Quality Standards; MAAQS) for hydrogen sulfide (H_2S) and particulate matter (PM) (Minn. R. part 7009.0080). The MPCA is responsible for compliance with state and federal standards for air quality in Minnesota.

The Air Quality Index, or AQI, was developed by the EPA to provide a simple, uniform way to report daily air quality conditions. Minnesota AQI numbers are determined by hourly measurements of five pollutants:

- fine particulate matter ($PM_{2.5}$),
- ground-level ozone (O_3),
- sulfur dioxide (SO_2),
- nitrogen dioxide (NO_2), and
- carbon monoxide (CO).

The pollutant with the highest AQI value determines the overall AQI for that hour.

Many factors can lead to poor air quality days. Air pollution levels in Minnesota come from both local pollutant emissions from sources such as industries, cars, and homes, as well as pollution that is blown into Minnesota from surrounding areas. The MPCA monitors outdoor air quality at over 59 air quality monitoring stations that are dispersed across the state. Collected data are used to determine if Minnesota meets the federal and state air quality standards and health benchmarks. The MPCA ranks air quality breakpoints based on the reported levels of indicators and places them into one of five narrative categories: good, moderate, unhealthy for sensitive groups (USG), unhealthy, and very unhealthy. The Air Quality Index ranks and values are summarized in **Table 23**.

Table 23: MPCA AQI Breakpoints

Category (and Color)	AQI Value	O_3 (ppb) 8-hour	CO (ppm) 8-hour	SO_2 (ppb) 24-hour	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 (ppb) 1-hour
Good (Green)	0-50	0-59	0.0-4.4	0-34	0.0-12	0-53
Moderate (Yellow)	51-100	60-75	4.5-9.4	35-144	12.1-35.4	54-100
Unhealthy for Sensitive Groups (Orange)	101-150	76-95	9.5-12.4	145-224	35.5-55.4	101-360
Unhealthy (Red)	151-200	96-115	12.5-15.4	225-304	55.5–150.4	361-640
Very Unhealthy (Purple)	201-300	116-374	15.5-30.4	305-604	150.5 – 250.4	650-1,240

Source: (MPCA 2018a)

The closest AQI monitoring station to the Route A ROW is located due east in Rochester, Minnesota. The Rochester station monitors ozone and fine particulate levels. Refer to **Table 24** below for the AQI levels for Rochester for the past five years (MPCA 2018b).

Table 24: Air Quality Index for Rochester, MN (2012-2016)

Year	AQI (days)		
	Good	Moderate	Unhealthy for Sensitive Groups
2012	260	93	3
2013	283	80	0
2014	301	59	1
2015	315	49	1
2016	328	36	1

Source: (MPCA 2018b)

Air quality in Rochester has improved in the past five years, with a steady decrease in the number of moderate and USG days since 2012 (see **Table 24**).

Impacts and Mitigation

The construction of the Route A ROW may result in direct and indirect emissions of criteria air pollutants and greenhouse gas emissions. These emissions would be short-term and localized.

As transmission lines themselves do not appreciably affect air quality, there will be no permanent environmental impacts to air quality from the operation of the generation tie line. However, due to corona discharge, a small amount of ozone is created during the operation of the transmission line (EPRI 1982). Ozone production due to corona discharge is dependent on ambient weather conditions, which decreases with humidity and moderately with temperature, and increases during rain events. Typically, ozone production during fair conditions is not detectable and ozone production during rain events is only detectable using specialized methods (EPRI 1982). The design of the generation tie line can also affect ozone production. As the diameter of the conductor increases, relative to the voltage, the corona discharge and associated ozone creation decreases. Additionally, ozone creation is greatly reduced when utilizing bundled conductors instead of single conductors. Currently, the Applicant will utilize bundled 795 kcmil "Drake" aluminum conductor steel-reinforced cable for the generation tie line, which complies with the recommended BMPs for reducing corona discharge, resulting in a reduction of ozone

production. Therefore, due to its design, the Project is not anticipated to have a significant impact on the environment through ozone creation.

Minor temporary effects on air quality may occur during construction of the proposed project as a result of exhaust emissions from construction equipment and other vehicles, and from fugitive dust that may become airborne during Route A ROW clearing or construction activities in dry conditions. The Applicant will employ BMPs, as necessary, to minimize the amount of fugitive dust created by construction activities, including the following:

- Minimizing idling of construction vehicles;
- Ensuring that construction equipment is properly tuned and maintained prior to and during on-site operation; and
- Using mechanical sweepers on paved surfaces where necessary to prevent dirt buildup, which can create dust.

Potential impacts to air quality from exhaust emissions are expected to be negligible because of the relatively short construction timeframe. In addition, any short term air quality impacts related to the construction activity that would occur along the Route A ROW would be similar to the pre-existing agricultural activities already prevalent within the Route A route width study area. No significant or long-term impacts to air quality are anticipated from the operation of the Project; thus, no mitigation measures are proposed during operation.

5.8.2 Water Quality

The Clean Water Act (CWA) mandates that each state publish a list of impaired waters (waterbodies that do not meet water quality standards due to excessive pollution) every two years under Section 303(d) of the CWA. In Minnesota, the MPCA has jurisdiction over determining 303(d) waters and publishes this bi-annual list, known as the 303(d) list. The majority of impairments to surface waters in the Route A route width study area are caused by agricultural sources (fecal coliform, dissolved oxygen, turbidity, excess nutrients/eutrophication). There is one listed impaired water (Cascade Creek) crossed by the Route A alignment (**Table 25**; see **Map 6 (Surface Water Map)** in **Appendix H (Environmental Feature Maps)**). Cascade Creek is listed as an impaired water due to turbidity (MPCA 2016).

Table 25: Impaired Waters Crossed by Route A

Waterbody Name	Cause of Impairment
Cascade Creek	T = Turbidity

Source: (MPCA 2016)

In addition to the above Section 303 jurisdictional authority, the MPCA has jurisdiction of Section 401 of the CWA. Section 401 requires that projects which discharge into jurisdictional waters obtain a Water Quality Certification (WQC) in compliance with state and federal water quality regulations.

Finally, the State of Minnesota designates specific surface waters as trout streams or lakes, according to Minn. Stat. Section 6264.0050. No designated trout streams or lakes are within the Route A route width study area or are crossed by the Route A alignment.

Impacts and Mitigation

Construction activities associated with the construction of the proposed Route A alignment have the potential to temporarily impact water quality along the Route A ROW. Surface waters, including streams and ditches crossed by the Route A alignment, are narrow and normal spacing of the permanent transmission structures are expected to fully span all surface water features and will be outside the banks of these surface waters. Mitigation measures will be implemented to prevent sedimentation; however, temporary, minor water quality impacts may occur during the construction of the proposed Project. The main potential construction-related impact to water quality is from the disturbed soils which have the potential to enter waters during storm events or snowmelt. Byproducts of this potential runoff include increased turbidity and localized sedimentation of the stream. These types of sedimentation events would result in a temporary alteration of the water quality and can be minimized with the incorporation of a Stormwater Pollution Prevention Plan (SWPPP) and associated BMPs (*e.g.*, straw wattles, silt fencing, erosion control blanket, etc.). Agriculture is likely to have the greatest impact on water quality in the vicinity of the Project. The potential for a limited, temporary increase in the sediment load in the water caused by construction activities would be minor in comparison with the agricultural activities and runoff that already occur regularly in the Route A route width study area.

To the greatest extent practicable, mitigation measures would be incorporated to minimize surface water impacts during the construction of this Project. The Applicant will apply for a National Pollutant Discharge Elimination System (NPDES) Permit from the MPCA, including the development of a SWPPP identifying BMPs to be incorporated during construction to minimize erosion and sedimentation. Additionally, any equipment maintenance, fueling of vehicles, or storage of chemicals should be away from any surface waters to protect against

impacts to surface waters. Spills should be controlled and cleaned up immediately to eliminate the potential for the material to enter surface waters.

5.8.3 Primary Water Resources

The Route A route width study area is part of the Lower Mississippi River Watershed (USEPA 2018). The Route A alignment passes through one sub-watershed of the Lower Mississippi River Watershed: the Zumbro Watershed (USEPA 2018). The Lower Mississippi River and Zumbro River watershed areas are part of the Upper Mississippi – Region 7 water resource region, as defined by the U.S. Geological Survey (USGS). **Table 26** below contains the 8-digit HUC USGS identifier for the Zumbro Watershed.

Table 26: Watersheds (8-digit HUC) Crossed by Route A

Watershed Name	HUC (8-digit)	Crossing Length (miles)
Zumbro	07040004	21.41

Six primary surface water features occur within the Route A alignment: Cascade Creek, Salem Creek-North Fork, and four unnamed creeks. Two unnamed creeks are crossed in the eastern half of the Route A alignment and are tributaries of Salem Creek. The other two unnamed creeks occur within the western half of the Route A alignment and are tributaries to Dodge Center Creek. Cascade Creek and Salem Creek-North Fork are both located in the eastern half of the Route A alignment. No large lakes are located in the Route A route width study area. Refer to **Map 6 (Surface Water Map)** in **Appendix H (Environmental Feature Maps).**

Impacts and Mitigation

Impacts to primary water resources and any applicable mitigation for the Route A alignment are discussed in the sections below.

5.8.4 Groundwater Resources

The State of Minnesota contains six distinct groundwater areas based on information from the MNDNR (2001). The Route A route width study area is located partially within South-central Province 2 and Southeastern Province 3 in the southeastern corner of the state. Route A crosses Province 3 along the eastern portion of the route in Olmsted County and eastern Dodge County. Province 3 has thin or no unconsolidated sediments over bedrock, however the bedrock has productive aquifers. The remainder of Route A crosses Province 2. This province has clayey overburden with limited use surficial or buried sand aquifers. The sedimentary bedrock is commonly used for a groundwater supply (MNDNR 2001). The general availability of groundwater from bedrock aquifers is good for both Provinces. The Route A alignment crosses

both Provinces. Refer to **Map 7 (Groundwater Province Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing the groundwater provinces along Route A.

The Minnesota Department of Health (MDH) manages the County Well Index, Source Water, and Wellhead Protection Programs. The County Well Index is a database that contains groundwater well information for over 340,000 wells in Minnesota (MDH 2018). Review of the County Well Index indicates that there are 26 wells located within the Route A route width study area, with depths ranging from 75-400 feet below the surface. None of these wells are located within the Route A ROW.

Impacts and Mitigation

Overall, impacts to groundwater resources are not anticipated since continuous need for groundwater use will not be required and intrusion into groundwater systems is not projected to occur. Major impacts to groundwater resources and wells are not expected from the construction and operation of Route A due to abidance of setbacks and the minimal water-related needs. O&M water requirements will be fulfilled with either well or rural water service.

Wells in the Route A route width study area typically range from 75 feet to 400 feet deep, which is significantly deeper than the maximum structure foundation depth, which is generally anticipated not to exceed approximately 40 feet. Well locations will be taken into account and generation tie line structures will be set back following state and county standards as needed. Construction and operation of Route A is not expected to impact groundwater resources; therefore, no mitigation is proposed.

5.8.5 Wetlands

The majority of wetland features within the Route A route width study area are associated with watercourses (which are discussed further in **Section 5.8.6**). The USFWS National Wetland Inventory (NWI) data mapping indicates that many of these wetlands associated with watercourses are categorized as emergent, shrub/scrub, or forested wetlands (see **Map 8 (National Wetlands Inventory Update for Minnesota Map)** in **Appendix H (Environmental Feature Maps)**). In addition, some NWI mapped wetlands within the Route A route width study area are present in cultivated fields and may be actively farmed. Based on aerial photograph interpretation, a moderate number of these watercourses and associated wetlands are also likely jurisdictional Waters of the U.S. (WOUS) due to their apparent connectivity with the Mississippi River, a Traditional Navigable Water (TNW).

According to the USFWS NWI database (USFWS 2018), the Route A route width study area contains approximately 107 mapped NWI wetlands which equates to approximately 185 acres. Wetland types and their associated acreages are illustrated in **Table 27** (USFWS 2018). The Route A ROW contains 21 wetlands totaling approximately 9.84 acres (**Table 28**).

Table 27: NWI Wetlands Crossed by Route A Route Width Study Area

NWI Wetland Type	Total Count of Wetlands in Route Width	Acreage of Wetland in Route Width
Palustrine Emergent (PEM)	60	115.43
Palustrine Forested (PFO)	30	35.24
Palustrine Shrub/Scrub (PSS)	8	20.63
Palustrine Unconsolidated Bottom (PUB)	7	2.56
Freshwater Pond (PAB)	1	0.16
Riverine Waters	1	11.42
Total	**107**	**185.44**

Table 28: NWI Wetlands Crossed by Route A ROW

NWI Wetland Type	Total Count of Wetlands in ROW	Acreage of Wetland in ROW
Palustrine Emergent (PEM)	14	5.63
Palustrine Forested (PFO)	4	1.34
Palustrine Shrub/Scrub (PSS)	2	2.67
Riverine Waters	1	0.2
Total	**21**	**9.84**

Calcareous fens are not found within the Route A route width study area based on MNDNR data. The closest mapped calcareous fen is located approximately six miles north of the Route A route width study area. Calcareous fens are rare and distinctive wetlands characterized by non-acidic peat with a constant supply of calcium and magnesium bicarbonate rich groundwater. This specialized environment is dominated by a calcium-loving plant community. Due to the specialized nature of fens, it is unlikely to find fen habitat within the Route A route width study area (MNDNR 2017).

Impacts and Mitigation

Routing of Route A included identifying and avoiding potential jurisdictional wetland and non-wetland areas to the extent feasible. Wetland resources will be field-verified and officially delineated prior to construction. Generation tie line structures will be sited so as to avoid or minimize adverse impacts to the extent feasible. Overall, impacts to wetlands should generally be minor. A grid network of county and township roads currently exist within the Route A route

width study area that will offer considerable access to the Route A ROW, further reducing the potential for wetland impacts.

Potential impacts to emergent wetlands and forested/scrub-shrub wetlands are likely to occur from the development of Route A. There are 14 emergent wetlands, four forested wetlands, and two scrub-shrub wetlands within the Route A ROW, totaling approximately 9.84 acres (**Table 29**). Of this acreage, approximately 4.01 acres are PFO and PSS. Permanent impacts may consist of pole installation within a wetland feature or wetland conversion (*i.e.*, tree trimming and woody vegetation removal) of shrub-scrub or forested wetlands within the ROW for the permanent maintenance and operation of the generation tie line. Conversion of scrub-shrub and forested wetlands may affect the health of the respective wetland systems and the functions that these wetlands perform. Temporary impacts to wetlands may consist of temporary matting to allow construction crews to access the Route A ROW and temporary incidental sedimentation from construction runoff. **Table 29** includes a summary of more detailed data pertaining to wetland impacts.

Table 29: Potential Impacts of Route A on Wetlands

Route A Potential Impacts	Total
ROW (acres)	333.47
Total Wetlands within the ROW (acres)	9.84
Number of Wetlands Crossed by Route A alignment	18
Number of Wetlands within ROW	21
Number of Wetlands within Route A Route Width Study Area	107
Percent of the ROW that Crosses Wetlands	2.95%
Forested Wetlands in ROW (acres)	1.34
Number of Forested in ROW	4
Percent of the ROW that Crosses Forested Wetlands	0.40%
Scrub-Shrub Wetlands in ROW (acres)	2.67
Number of Scrub-Shrub Wetlands in ROW	2
Percent of the ROW that Crosses Scrub-Shrub Wetlands	0.80%
Emergent Wetlands in ROW (acres)	5.63
Number of Emergent Wetlands in ROW	14
Percent of the ROW that Crosses Emergent Wetlands	1.69%

Wetland delineations have occurred at pole locations for Route A. Currently, Route A avoids pole installation impacts to all wetlands within the Route A ROW. However, there are approximately 2.67 acres of scrub-shrub wetland and 1.34 acres of forested wetland within the Route A ROW, totaling 4.01 acres of woody wetland vegetation. As such, approximately 4.01 acres may be impacted through wetland conversion for the development and maintenance of the

Project. This acreage represents the worst case scenario and actual conversion is anticipated to be less.

In the State of Minnesota, agencies representing three levels of government (federal, state, and local) regulate certain activities that affect wetlands, lakes, and watercourses. Wetlands are federally protected under Section 404 of the CWA. A wetland permit from the United States Army Corps of Engineers (USACE) is required when discharging dredged or fill material into jurisdictional wetland and/or non-wetland WOUS. A permit and/or Pre-construction Notification (PCN) may also be required by the local watershed district depending upon the location, size, and type of impact. Mitigation by the USACE is required if certain permit thresholds are met.

Any wetland listed in the PWI maps (MNDNR 2018) that may be impacted would require a Public Waters Work Permit. A Public Waters Work Permit must be obtained from the MNDNR for work affecting the course, current, or cross-section of public waters, including public waters wetlands. Moreover, a license from the MNDNR is required to cross PWI waters with an electric transmission line. Most other wetlands not listed in the PWI are regulated under the Minnesota Wetland Conservation Act of 1991 (WCA). The WCA is administered by the Minnesota Board of Water and Soil Resources and is implemented by LGUs. There are two different LGUs administering the WCA within each county's respective portions of the Route A route width study area. These LGUs are the Dodge County Environmental Services Department and the Olmsted Soil and Water Conservation District. Generally, an LGU Replacement Plan is required by the WCA for an impact that wholly or partially drains or fills a wetland.

During the design phase of Route A, measures will be taken to largely avoid or minimize impacts to wetland areas. Results of the wetland desktop analysis and constraints analysis will be considered by the Applicant in an effort to avoid wetlands to the maximum extent practicable. All wetlands, where possible, will be crossed aerially and transmission pole placement will be sited so as to avoid impacts. If temporary or permanent impacts to wetlands are unavoidable, the impacts will be minimized to the maximum extent practicable. BMPs will be employed to protect topsoil, minimize soil erosion, re-vegetate disturbed areas with non-invasive species, and protect wetland resources from direct and indirect impacts. Wetland soils and moderately to strongly sloped ground can also be subject to sheet and rill erosion or slumping. Depending on site specific needs, seasonal construction scheduling, cutting trees where the stumps remain, temporary timber matting, erosion control blankets, mulch, straw bales, rolls, tackifiers, temporary seeding, hydro-mulch, and sediment fence may be used to manage soil erosion. Where feasible, a narrower construction corridor may be considered to minimize impact.

A SWPPP and NPDES permit will be obtained prior to construction. Significant adverse impacts to wetlands are not anticipated because of conscientious design considerations and the implementation of stormwater BMPs.

Compensatory mitigation may be required if certain impact thresholds are surpassed. Currently, it is the Applicant's understanding that there are three types of compensatory mitigation available: (i) project-specific (permittee-responsible) compensation; (ii) in-lieu fee; and (iii) mitigation banking. Permittee-responsible compensation requires the permittee to provide wetland/aquatic resource restoration, creation, enhancement and/or preservation, either on-site and/or off-site in relation to the permitted impact area. Purchase of wetland mitigation bank credits is the preferred method of compensation by the USACE, MNDNR, and many LGUs.

5.8.6 Lakes, Rivers, Streams, and Ditches

The Route A route width study area is located within the Upper Mississippi River Basin and is found within the Zumbro watershed (HUC8 07040004) (USEPA 2018). Within this drainage basin, numerous intermittent and ephemeral watercourses, and a few perennial watercourses, are scattered across the Route A route width study area.

Section 404 of the CWA and Section 10 of the Rivers and Harbors Act require a permit from the USACE for any discharge of dredged or fill materials into jurisdictional WOUS. No Section 10 waters are located within the Route A route width study area. However, many of the watercourses crossed by the Route A alignment are likely to be jurisdictional WOUS under Section 404 of the CWA.

Those waters designated by the State of Minnesota as Public Waters (Minn. Stat. § 103G.005, Subdivision 15) are regulated by the MNDNR. These waters comprise the PWI as set forth in Minn. Stat., Section 103G.005, Subdivision 15 (MNDNR 2018). The MNDNR requires a license to cross PWI waters with an electric transmission line (Minn. Stat. § 84.415). The MNDNR will require a Public Waters Work Permit to alter the course, current or cross-section of any water listed in the PWI.

According to the USGS National Hydrography Dataset (NHD), the Route A alignment crosses 20 NHD waters (USGS 2018) (**Table 30**). Six of these streams are MN public watercourses with designated 50-foot buffer requirements according to the MN Buffer Law (MNDNR 2017b). These include the perennial Cascade Creek and North Fork Salem Creek in the northeast and east central portion of the Route A alignment and four perennial tributaries; two tributaries to Salem Creek in the central portion and eastern portion of the Route A alignment and two associated with Dodge Center Creek in the western portion of the Route A alignment (**Table 31**). Refer to **Map 6 (Surface Water Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing surface water and PWI features along Route A.

Table 30: Impacts to PWI Waters and Shallow Lakes for Route A

Route A Impacts	Total
Number of NHD Stream and River Crossings by Route A Alignment	20
Number of PWI Stream and River Crossings by Route A Alignment	6
Number of PWI Lakes within Route A Route Width Study Area	0
Number of PWI Lakes within ROW	0
Number of Shallow Lakes within Route A Route Width Study Area	0
Number of Shallow Lakes within one mile of Route A Route Width Study Area	0

PWI-designated watercourses that intersect the Route A alignment are listed below in **Table 31**.

Table 31: Minnesota Designated PWI Streams and Rivers Crossed by the Route A Application Alignment

Waterbody Name	Number of Crossings
Salem Creek, North Fork (M-034-082-004)	1
Unnamed Creek (M-034-082-018)	1
Unnamed Creek (M-034-082-006)	1
Cascade Creek (M-034-071)	1
Unnamed Creek (M-034-056-004-021-002)	1
Unnamed Creek (M-034-056-004-021-001-001-003)	1

In addition to the review of watercourse and PWI waters summarized in **Table 30** and **Table 31** above, the Route A route width study area was reviewed for lakes. This review revealed that no PWI lakes are located within the Route A route width study area.

Impacts and Mitigation

Permanent impacts to lakes, rivers, streams, and ditches are not expected to occur from the development of Route A as pole structures are not planned within these features. Temporary impacts may consist of temporary culverts/ crossings below the ordinary high water mark (OHWM) to allow for access throughout the Route A ROW and temporary sedimentation from

construction runoff. The Applicant will work with the USACE and MNDNR to ensure all proper permits, licenses, and approvals are obtained for surface water crossings by the Route A alignment. The USACE administers permitting for WOUS. Impacts to WOUS may need to be mitigated. The MNDNR has jurisdiction for State Public Waters listed in the PWI. Through the permitting approval process, the Applicant and the MNDNR will determine the appropriate mitigation measures for PWI crossings.

An NPDES permit will be obtained by the Applicant from the MPCA for the construction of the Project. The Applicant will also develop a SWPPP in compliance with all MPCA rules and guidelines. All waterways crossed by the Route A alignment would be maintained for proper drainage. Temporary culverts or other temporary crossing devices would be utilized to maintain proper drainage in accordance with the SWPPP and any permit requirements. If construction within the ROW requires tree removal along waterways, where feasible, trees would be cut so that the root system remains intact, in order to retain bank stability. If necessary, sediment barriers would be placed along waterways and slopes during construction to protect stream banks from soil erosion and watercourses from sedimentation. Limited permanent impacts to surface water resources are anticipated.

5.8.7 Floodplains

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) are available for most of the Route A route width study area (only the Olmsted County portions of the Route A route width study area are not mapped by FEMA). Within Dodge County, there are approximately 194 acres of mapped 100-year floodplains (Zone A) for Salem Creek, Salem Creek-North Fork, and associated tributaries within the Route A route width study area (FEMA 2018). Additionally, in Dodge County there are approximately 2 acres of mapped 100-year floodplains (Zone A) associated with Cascade Creek within the Route A route width study area (FEMA 2018). Within the Dodge County portion of the Route A ROW, there are approximately four acres of mapped 100-year floodplains (Zone A) associated with Salem Creek-North Fork and an unnamed tributary to Salem Creek. A large expanse of the Route A route width study area that has agricultural watercourses has been determined as an area with minimal flood hazards (Zone C). The majority of base flood elevations have not been determined for the Route A route width study area. See **Map 6 (Surface Water Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing floodplains along Route A.

Impacts and Mitigation

Extensive planning and analysis efforts were made to site Route A such that floodplain areas were avoided and that where floodplain crossings were necessary, that crossings could be made in locations narrow enough to facilitate pole spanning so as to avoid placement of transmission structures within floodplains. During detailed design, to the extent feasible, transmission structures will avoid floodplain areas. The current pole locations do not include any structures

within floodplains. Should the placement of transmission structures in floodplains be necessary, permitting will be sought and any necessary mitigation will be implemented. Any impacts to floodplains resulting from a limited number of pole placements would be minor and would not impact the function of the floodplain.

5.8.8 Flora

The Route A route width study area spans the following Minnesota ecological regions and subsections (MNDNR 2018a):

- Eastern Broadleaf Forest (Province)
    - *Minnesota and Northeast Iowa Morainal* (Section)
        - Oak Savanna Subsection (222Me)
    - *Paleozoic Plateau* (Section)
        - Rochester Plateau Subsection (222Lf)

The Eastern Broadleaf Forest Province spans approximately 12 million acres of eastern North America. Approximately 69% of the Route A route width study area occurs within the eastern edge of the Oak Savanna Subsection (222Me) and approximately 31% of the Route A route width study area occurs within the Rochester Plateau Subsection.

The Oak Savanna Subsection (222Me) is a fire prone region historically occupied by relatively expansive bur oak savanna. Oak savanna typically is concentrated at the juxtaposition of prairie and heavily forested landscapes. Overall vegetation structure can be characterized as scattered, mature trees with minimal closed forest canopy and continuous tallgrass prairie and forb understory. The dominant tree species is bur oak (*Quercus macrocarpa*). Areas with denser forest canopy (*i.e.*, >30% canopy closure) are a direct result of fire suppression (NatureServe 2017). Wetlands occupy an important role in this ecosystem, particularly from a historical context.

Modern day settlement throughout southeastern Minnesota has converted much of this ecological region to urban centers and cultivated agricultural lands (MNDNR 2018a). No ecological subsection in southern Minnesota is currently comprised of greater than 5% oak savanna (*i.e.*, upland shrubland/woodland; MNDNR 2006a), particularly the region spanned by the Route A route width study area.

Where the eastern border of the Oak Savanna Subsection meets the Rochester Plateau Subsection, additional hardwood forest ecosystems become more prevalent and regions of maple-basswood forest can thrive, particularly where topographic features contribute to natural fire suppression. The North-Central Interior Maple-Basswood Forest is comprised primarily of mesic deciduous species, typically with foliage canopy that is quite dense. High canopy closure contributes to a dense mixture of understory growth of shrubs and forb species (NatureServe 2017). Since this forested habitat often is associated with sloped topography and bottoms, these

landscape features primarily drive the occurrence of this forest type within the vicinity of the Route A route width study area.

Similar to the Oak Savanna subsection, the Rochester Plateau has experienced significant conversion of natural vegetation communities to agriculture and urban developments. Approximately 7% of the subsection remains as forest cover and wetland/grassland habitat. As the Route A alignment moves from the Oak Savanna east into the Rochester Plateau subsection, the numbers of documented Species of Greatest Conservation Need (SGCN) records (*i.e.*, per township) increases notably (MNDNR 2006a).

Today, the majority of both ecological subsections consist primarily of row crop agriculture (a minimum of at least 69% agricultural coverage; MNDNR 2006b). Similarly, the majority of the Route A alignment spans agricultural row crop. The 2011 National Landcover Database – Land Use-Land Cover dataset (Homer et al. 2015) indicates that the Route A route width study area contains approximately 5,067 acres of cultivated land, or about 83% of this study area. Additionally, the Route A ROW traverses an area comprised of approximately 72% cultivated row crop land cover (**Table 9**).

Approximately, 631 acres of non-cultivated vegetation cover are intersected by the Route A route width study area (*i.e.*, 10%), whereas approximately 30 acres of non-cultivated vegetation cover is intersected by the ROW (*i.e.*, 9%; **Table 9**). Of this acreage that intersects the ROW, herbaceous/grassland and hay/pasture classification represents the majority of natural land cover. Approximately 2.3 acres of deciduous woodland is indicated as being traversed by the ROW.

A preliminary aerial interpretation of the above natural vegetation areas that intersect the ROW indicates that most deciduous woodland areas consist of isolated wooded areas or small riparian corridors. The largest woodlot crossed by the Route A ROW is associated with Salem Creek – North Fork. The Route A alignment parallels the edge of several of these wooded areas. There is no indication that subject wooded areas traversed by the Route A ROW are consistent with remnant bur oak savanna or other woodlands that MNDNR would designate as native plant communities of particular conservation focus.

Regarding herbaceous/grassland classification acreage, approximately 14.9 acres intersect the ROW. A preliminary aerial interpretation of this vegetation classification indicates that much of this acreage may be associated with shrub-scrub or emergent wetlands or could currently be in cultivation. NWI data corroborate that the ROW intersects emergent and shrub-scrub wetland acreage.

USGS Gap Analysis Program (GAP) (2015) data indicate the following ecosystem classifications that intersect the Route A route width study area and ROW (refer to **Map 9 (GAP Land Cover Map)** in **Appendix H (Environmental Feature Maps)**). Acreages of these native vegetation communities likely represent the highest flora species richness (*e.g.*, NatureServe 2017):

Route A Route Width Study Area

- North-Central Interior Dry-Mesic Oak Forest and Woodland
- Ruderal forest
- Western Great Plains Wooded Draw and Ravine
- North-Central Interior Maple-Basswood Forest
- Central Interior and Appalachian Floodplain Systems
- North-Central Interior and Appalachian Rich Swamp
- Central Interior and Appalachian Shrub-Herbaceous Wetland Systems
- Harvested Forest - Grass/Forb Regeneration
- Recently burned shrubland

Route A ROW

- North-Central Interior Dry-Mesic Oak Forest and Woodland
- North-Central Interior Maple-Basswood Forest
- Central Interior and Appalachian Floodplain Systems
- Central Interior and Appalachian Shrub-Herbaceous Wetland Systems
- Harvested Forest - Grass/Forb Regeneration
- Recently burned shrubland

Together, these GAP plant community classifications account for 2.6% of the Route A route width study area acreage and 1.4% of the Route A ROW.

Non-cultivated land cover acreage is concentrated within the easternmost one-third of the Route A route width study area, particularly the portion that crosses into Olmsted County. Visual assessment of aerial imagery yields at least seven habitat (*i.e.*, relatively natural vegetation) crossings of the Route A ROW. These habitat crossings likely consist of a fairly diverse group of flora species, yet no part of this landscape appears to be consistent with historic oak savanna dominated land cover.

Sites of Biodiversity Significance (MNDNR)

The Minnesota Biological Survey (MBS) identifies three *Sites of Biodiversity Significance* that are located completely within and/or partly overlap the Route A route width study area (MBS 2017). Each of these Sites of Biodiversity Significance is entirely within Dodge County.

The MBS uses classification ranking system to denote the level of biological diversity characteristics of a particular site. Ranking classifications are based on the degree to which the occurrences of the rarest species, including rarest native plant communities or the most intact native ecosystems, are present (MNDNR 2018b). Two of the sites within the Route A route width study area are given a biodiversity significance ranking of *below* and one is given a biodiversity significance ranking of *moderate* (**Table 32**; refer also to **Map 10 (Rare and**

Unique Natural Features Map) in **Appendix H (Environmental Feature Maps)**). Sites ranked as *below* lack occurrences of rare species and natural features or do not meet the minimum MBS threshold for biodiversity significance. These sites may include areas of conservation value at the local level, such as habitat for native plants and animals, corridors for animal movement, buffers surrounding higher-quality natural areas, areas with high potential for restoration of native habitat, or open space. Sites ranked as *moderate* contain occurrences of rare species, moderately disturbed native plant communities, and/or landscapes that have strong potential for recovery of native plant communities and characteristic ecological processes. The three sites are as follows:

- Canisteo 19 – 28.85 acres within the Route A route width study area and 0.75 acres within Route A ROW
- Canisteo 23 - 48.68 acres within the Route A route width study area
- Ashland 21-22 – 14.84 acres within Route A route width study area and 14.81 acres within Route A ROW

Table 32: Sites of Biodiversity Significance associated with Route A

Site of Biodiversity Significance Ranking	Number of Sites Within Route A Route Width Study Area	Acres	Number of Sites Within Route A ROW	Acres
Below	2	43.69	2	15.56
Moderate	1	48.68	0	--
High	0	--	0	--
Outstanding	0	--	0	--

Designated Critical Plant Habitats (USFWS)

A broader scale Information Planning and Consultation (USFWS 2018a, b) analysis indicated that two federally threatened flowering plant species have the potential to occur in this region of Minnesota:

- Leedy's Roseroot (*Rhodiola integrifolia leedyi*)
- Prairie Bush-Clover (*Lespedeza leptostachya*)

According to USFWS recovery plan information, critical habitat for either species has not been designated (USFWS 2018a, b). Furthermore, Leedy's roseroot is an exceedingly rare wildflower that is isolated to cliffside habitats. The Route A ROW does not traverse such topographic features. Prairie bush-clover typically occurs on mesic prairie slopes. USGS GAP data do not indicate that prairie habitat cover is encompassed by the Route A route width study area (also, see below section regarding MNDNR designated native prairies).

Please refer to **Section 5.8.10** for a more detailed discussion of rare and threatened and endangered species (TES) for the Route A route width study area.

Native Plant Communities & Prairies

The MNDNR specifically defines recognizable native plant community units. Oak savanna is an example of one such designated natural community. There are MNDNR designated native plant communities in the vicinity of the Route A route width study area, with one crossing into the Route A route width study area. Specifically, 34.80 acres of *Southern Wet-Mesic Hardwood Forest* (MHs49) along Salem Creek intersects the southeast edge of the Route A route width study area (refer to **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps))**. This plant community does not intersect the Route A ROW. This rich plant community consists of low-lying hardwood forests on level silty alluvium that continually retains moisture. Woodland sites are not fire-prone and are typically associated with stream valleys and on level glacial till bordering lakes (MNDNR 2009). Disease eliminated much of the elm species (*Ulmus* sp.) that that historically comprised much of this forest canopy, but modern forests are dominated by black ash (*Fraxinus nigra*).

Similarly, specific designated native prairies occur within the region but do not cross into the Route A route width study area.

Impacts and Mitigation

Construction and subsequent maintenance of the Route A ROW is expected to primarily impact crop cultivation and common vegetation associated with roadside ditches. Minimal other natural vegetation is anticipated to be impacted during establishment of the ROW. Approximately 1.4% of the Route A consists of natural habitats that likely contain the greatest plant species richness (**Table 33)**. As such, more than 98% of the ROW will be avoiding impacts to natural flora communities. Additionally, the ROW will not impact recognized areas of high quality biodiversity significance or specifically designated native plant communities.

Table 33: Summary of Estimated Natural Vegetation within Route A ROW

Land Cover (GAP 2011)- Route A ROW		
Ecosystem Category	**Acres**	**Percent of ROW**
North-Central Interior Dry-Mesic Oak Forest and Woodland	1.51	0.45%
North-Central Interior Maple-Basswood Forest	0.58	0.17%
Central Interior and Appalachian Floodplain Systems	0.05	0.02%
Central Interior and Appalachian Shrub-Herbaceous Wetland Systems	0.11	0.03%
Cultivated Cropland	262.53	78.73%
Pasture/Hay	16.81	5.04%
Harvested Forest - Grass/Forb Regeneration	2.18	0.65%
Recently burned shrubland	0.34	0.10%
Developed, Open Space	42.66	12.79%
Developed, Low Intensity	5.82	1.74%
Developed, Medium Intensity	0.89	0.27%

Construction may result in minor unavoidable impacts to drainages or other low profile vegetation features. The Applicant with coordinate with the local NRCS office and MNDNR as appropriate regarding reseeding with locally-sourced native seed mixes and any additional BMP. Since impacts to native prairie are not anticipated and native prairies are not located within the Route A route width study area, preparation of a prairie protection and management plan in consultation with the MNDNR is not anticipated for the Project at this time. Additionally, impacts are not expected to occur to high quality MBS *Sites of Biodiversity Significance* (*i.e.*, ranked moderate, high, or outstanding) or Native Plant Communities. However, two *Sites of Biodiversity Significance* ranked as *below* exist within the Route A ROW: Ashland 21-22 and Canisteo 19. Due to the ranking of *below*, temporary and/or permanent impacts to these locations are not anticipated to significantly impact the biological quality of the region. Impacts to these sites may consist of temporary grading and/ or rutting from construction equipment and permanent if a transmission pole is required within these locations. The Applicant will avoid temporary and permanent impacts within the two biodiversity sites, where feasible. Additionally, the Applicant will coordinate with the MNDNR, as appropriate.

The Applicant will implement BMPs during construction in order to control and prevent the introduction of invasive species to natural plant communities, as designated by the MDA (MDA 2018a, b). These BMPs include limiting invasive species spread via maintenance equipment and vehicles through early detection of invasive species, cleaning mowers and bladed equipment, minimizing disturbance to native areas, limiting traffic through weed-infested areas, and frequently inspecting equipment storage areas for weeds. In the event that invasive weeds are

detected within the Route A ROW, control through timing, cutting, and conducting targeted herbicide consistent with the herbicide BMPs published by the MN/DOT and MDA (MDA 2018c, MN/DOT 2018).

For impacts to cultivated crops and subsequent plan for mitigation, please reference **Section 5.6.1** of this permit application. For impacts to wetlands and subsequent plan for mitigation to those flora communities, please reference **Section 5.8.5** of this permit application.

5.8.9 Fauna

Wildlife typically associated with an agricultural landscape with a matrix of scattered prairie remnants, wetlands, and wooded areas are expected to be prevalent within the Route A route width study area. These wildlife species include mammals, various bird taxa, fish, aquatic invertebrates, and terrestrial insects.

Many common mammal species are likely to utilize the Route A route width study area including white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), red and gray fox (*Vulpes fulva* and *V. urocyon*), Virginia opossum (*Didelphis virginiana*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), and striped skunk (*Mephitis mephitis*). The larger mammal species are most likely to utilize the wooded areas and uncultivated grassland areas that are present within the Route A route width study area, while the smaller mammal species are likely to use those areas as well as the cultivated areas within the Route A route width study area.

The Route A route width study area is within the range of several bat species including little brown bat (*Myotis lucifugus*), big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), and the federally threatened northern long-eared bat (*Myotis septentrionalis*). These bats are fairly common within Minnesota, with the exception of the northern long-eared bat, and, while the range of these bats overlaps the general vicinity of the Route A route width study area, the preferred habitat of these species is not abundant near the Route A route width study area and is largely absent from the Route A ROW.

A wide variety of bird species are known to occur within this region of southeastern Minnesota and are likely to utilize the habitats present within the Route A route width study area. The Minnesota Breeding Bird Atlas (MNBBA; 2017) and Avian Knowledge Network (AKN 2018) data were assessed for species of conservation concern. The suite of species that is expected to occur within the greater Dodge and Olmsted County region is not higher than any other surrounding habitat or counties. Nearly 200 species of birds occur in this area on an annual basis, with over 100 species breeding in the regional vicinity of the Route A route width study area (AKN 2018, National Audubon Society 2018).

Primary protection for migratory bird species that are not federally or state-listed occurs under the Migratory Bird Treaty Act (MBTA) (MBTA 1918). The MBTA provides the primary legal protection for most birds in the United States (MBTA 1918). The MBTA makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, or purchase any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations. The migratory bird species protected by the MBTA are listed in *50 CFR 10.13*.

Of particular concern to the Route A ROW, would be known nest sites, particularly of raptors, where regular flights to and from nests may intersect line alignment. Several raptor species do nest within the Dodge-Olmsted County region, particularly bald eagle (*Haliaeetus leucocephalus*). MNDNR designates some raptor species as being of conservation concern (MNDNR 2016), such as Swainson's hawk (*Buteo swainsoni*), which is known to have a sparse nesting distribution that encompasses the Route A route width study area. Additionally, bald eagle and golden eagle (*Aquila chrysaetos*) are federally protected through the *Bald and Golden Eagle Protection Act* (BGEPA 1940).

Bald eagle nest surveys were conducted as part of the pre-construction due diligence for this proposed development (Atwell 2017a). Additional information related to known eagle nest resources in relation to the Route A route width study area are discussed below in **Section 5.8.10**. Data were collected on all observed nesting raptors, and general results indicate that raptor stick-nest structures occur in relatively low density across this landscape, possibly owing to the general scarcity of habitat. Aerial field surveys of the Route A route width study area yielded one red-tailed hawk known stick nest structure within the study area, but outside of the Route A ROW. It is located approximately 1,400 feet south of the Route A ROW.

Aquatic fauna (both vertebrate and invertebrate) are anticipated to be relatively scarce within the study area since open water resources does not occur within the Route A route width study area, and watercourse (*i.e.*, streams) crossings are minimal. A total of 20 NHD streams, six of which are PWI streams, (please refer to **Section 5.8.6**) occur along the Route A alignment. Based on aerial review, approximately seven of these streams are perennial, but these streams are narrow perennial streams that are expected to harbor aquatic animals common to southeastern Minnesota. Data pertaining to SGCN fish species, such as the Ozark Minnow (*Dionda nubila*), appear to be associated with Salem Creek and Salem Creek – North Fork. Salem Creek-North Fork crosses the ROW at one location (Dodge County), so aquatic animal assemblages that could contain more scarce species, are not anticipated to intersect the Route A alignment in more than a handful of places.

Please refer to **Section 5.2** and **Section 5.8.8** which discuss the different land cover types, available habitat, and natural communities that harbor much of the wildlife diversity that is found along the Route A route width study area.

Impacts and Mitigation

The construction, operation, and maintenance of the Route A alignment and associated ROW is where the primary impact to wildlife and their associated habitats may occur. The agriculture-dominated habitat matrix currently is highly fragmented and ROW construction may remove a minimal amount of wildlife habitat that could result in minimal additional habitat fragmentation.

Any permanent impacts to wooded habitats, particularly in association with riverine forested corridors, have the potential to impact bat maternity roost trees, should they be present. The federally threatened northern long-eared bat is known to have occurred within Dodge and Olmsted counties. However, to date no known northern long-eared bat roost trees are known to exist within the proposed Route A route width study area. For additional discussion about potential impacts to this species, please refer to **Section 5.8.10**.

For terrestrial wildlife habitats, Route A alignment design will be engineered to the extent practicable, to avoid placement of tower structures within these habitats, particularly within more sensitive habitats (*e.g.*, streams, wetlands). To the greatest extent practicable, these habitats will be spanned by the line and construction practices will plan to avoid bringing heavy equipment through these habitats. For avoidance and impact minimization construction practices associated with wetlands, please refer to **Section 5.8.5**.

Furthermore, the Route A alignment likely will not pose a significant barrier to movement/migration of most terrestrial wildlife species expected to occur in this region. ROW construction will not be spanning any officially designated conservation corridors or other notable wildlife habitat corridors (*e.g.*, Important Bird Areas [National Audubon Society 2018], state WMAs). In several instances where the ROW traverses wildlife habitat (*i.e.*, Olmsted County), the Route A alignment is planned to run parallel with an existing electric transmission/distribution corridor, so most impacts to wildlife movements through these habitat corridors potentially will not be exacerbated.

Of any animal species that reside or seasonally occur within the Route A route width study area, avian taxa likely will be the single species group that would likely experience a continual direct hazard from the Project. Transmission lines have been documented to pose a hazard for birds, through collision mortality and electrocution (Bevanger 1994, Erickson et al. 2005). As such, DCW will design the Project consistent with the Avian Power Line Interaction Committee (APLIC) guidelines. DCW will continue to coordinate with MNDNR.

Particular attention will be paid to portions of the Route A alignment that cross surface water features which have a higher likelihood of attracting relatively large concentrations of animals (APLIC 2006, 2012). Additionally, APLIC advises on various scenarios when bird flight diverters should be used to prevent collision fatalities (APLIC 2012). MNDNR has requested the use of bird diverters on overhead lines near lakes and rivers, or other areas that may attract

large concentrations of waterfowl and the Applicant will coordinate with MNDNR to best implement this request.

Known nest sites would be of particular concern to the Route A ROW, particularly of raptors, where regular flights to and from nests may intersect line alignments. Several raptor species do nest within the Dodge-Olmsted County region, particularly bald eagle and Swainson's hawk. Currently, the Route A ROW avoids known and/or active raptor nests.

5.8.10 Rare and Unique Natural Resources

(a) *Threatened and Endangered Species*

Federally Listed Species

The USFWS provides distribution lists of federally-listed threatened, endangered, and candidate species on a county-by-county basis. These lists were reviewed for Dodge and Olmsted counties. Additionally, the USFWS IPaC (USFWS 2018a) was used to assess which federally listed species occur within the near vicinity of the Route A route width study area. Broad-scale data analysis indicated that three federally threatened species may occur within the Route A ROW (**Table 34**). None of these species have officially designated critical habitat.

Dodge and Olmsted counties are within the range (*i.e.*, have documented records and/or have the potential to harbor critical habitat) of the federally threatened northern long-eared bat. This *Myotis* bat utilizes a forested landscape where summer roosting habitat depends on availability of suitable roost tree substrate (USFWS 2015). Preliminary data within Dodge County indicate that northern long-eared bat may be resident within the sparsely forested landscape in the vicinity of the Route A route width study area (Normandeau Associates, Inc. 2014). A preliminary desktop habitat review indicates that the majority of the Route A ROW poses no impacts to northern long-eared bat, but specific habitat crossings near Salem Creek – North Fork could impact potential habitat.

As described previously in **Section 5.8.8**, two federally threatened flowering plant species occur within the region of southeastern Minnesota traversed by the Route A route width study area (USFWS 2018a, b): Leedy's roseroot and prairie bush-clover. These two flowering species occupy notably different habitats that are not thought to be present within the Route A route width study area.

Prairie bush-clover (also state threatened) is a Midwestern bush clover endemic to healthy tallgrass prairie systems, particularly those maintained through periodic prescribed fire (USFWS 2018c). MNDNR (MNDNR 2018c) indicates that remnant populations in southwestern Minnesota typically occur on dry-mesic prairie slopes with populations concentrated in concave bowls containing gravely soils. Populations in southeastern counties are associated with upper slopes of bluff prairies, which may contribute to increase scarcity in this region of the state.

MNDNR presumes that remnant populations in level prairie areas have long since been plowed under and remain exceedingly rare if not extirpated. The Route A route width study area does not appear to traverse remnant prairies that fit the habitat profile to harbor this threatened species.

Leedy's roseroot (also state endangered) is an exceedingly rare plant in the United States and occurs in widely spaced populations in South Dakota, Minnesota, and New York (USFWS 2018d). In southeastern Minnesota, this rare flowering plant is known from a handful of isolated populations tied to maderate cliffs in the drainages of the Root River and Whitewater River (MNDNR 2005, USFWS 2018d). The Route A route width study area does not appear to traverse cliffside karst formations that fit the habitat profile to harbor this threatened species.

Additionally, bald eagle is federally protected through the *Bald and Golden Eagle Protection Act* (BGEPA 1940) and the National Bald Eagle Management Guidelines (NBEMG; USFWS 2007) guides development projects that may have impacts on nesting eagle pairs and nest sites. The Route A route width study area was evaluated *via* helicopter in 2017 and no active nests were identified. However, a single confirmed active eagle nest within Dodge County (Canisteo Township) was delineated approximately 0.42 mile from the Route A route width study area boundary. The nest is located approximately 0.56 miles south of the Route A alignment. The NBEMG specifies a 660-foot construction activities avoidance buffer for any known eagle nests during a specifically designated breeding season. Direct impacts to the nest tree are not anticipated given its distance from the Route A ROW.

MNDNR Listed Species

The Applicant requested a formal Natural Heritage Information System (NHIS) data summary of rare species and other significant natural resource features review from the MNDNR Natural Heritage Program (July 19, 2017; NHIS Correspondence # ERDB 20170420) for a broad study area encompassing the Route A route width study area. This database represents the single most up-to-date repository of records for rare or significant species occurrences. On August 16, 2017, the MNDNR replied with a data assessment and general review. The MNDNR assessment further incorporated data from a 1-mile buffer around this review area, which yielded records for a total of 18 species. These species represent a variety of terrestrial and aquatic species, including seven vascular plant species. Three of these species possess "watchlist" status and are tracked by MNDNR but do not have specific legal protections within the state.

One Sullivant's milkweed (*Asclepias sullivantii*; state threatened) record from 1983 overlaps the Route A ROW within the western portion of the route (see **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**). No other Sullivant's milkweed occurrences overlap the Route A ROW or the Route A route width study area, but there are four additional records of this flowering plant within relatively close proximity to the Dodge County portion of the Route A route width study area (Ashland and Ripley townships).

Each of these records was of plants in roadside ditch prairie remnants, some considered to be of poor quality (NHIS unpublished data). Sullivant's milkweed is a flowering plant native to the extensive tallgrass prairie associated with the Oak Savanna and Rochester Plateau subsections with many populations currently known from abandoned railroad ROW and remnant roadside habitats (MNDNR 2018d).

One wood turtle (*Glyptemys insculpta*; state threatened) record from 1979 intersects the Route A ROW within the eastern portion of Dodge County (See **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**). This record consists of one individual and covers approximately 5.3 acres of riparian habitat, with approximately 0.02 acres intersecting the Route A ROW. Wood turtles are primarily an aquatic species that utilize riparian habitat, preferably deciduous and coniferous forests, of small to medium sized streams with sand and gravel substrate. In agricultural settings, they have been known to forage within the agricultural fields and grass buffers adjacent to streams (MNDNR 2018g).

One ellipse (*Venustaconcha ellipsiformis*; state threatened) record from 1988 occurs within the Route A route width study area within Salem Creek, but outside of the Route A ROW (See **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**). This record consists of one individual. According to the species profile, the typical habitat for the ellipse is located within the gravel riffles of headwater streams and along silt laden stream banks (MNDNR 2018e).

Two mapped records for the Ozark minnow (*Notropis nubilus*; species of concern) exist within the Route A route width study area, but outside of the Route A ROW (See **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**). The first record consists of 36 fish and is from 1986 within Salem Creek – North Fork. The second record consists of seven fish and is from 1986 within Salem Creek. The Ozark minnow prefers small to medium clear perennial streams with minimal impacts from pollution and siltation. Ozark minnows can typically be found within slow moving water adjacent to riffles (MNDNR 2018f).

Another MNDNR state listed species of note is the loggerhead shrike (*Lanius ludovicianus*; state endangered). This medium sized songbird typically utilizes open habitats with scattered trees and shrubs, particularly pasture where barbed wire fencing is present (Eliason 1996). NHIS data noted two historic breeding records at the Dodge-Olmsted county line just to the west of the Route A route width study area. This region of southeastern Minnesota coincides with a large segment of the state's remnant population (Eliason 1996, AKN 2017, Pfannmuller et al. 2017). During June 2017, a site visit (2017b) confirmed the presence of nesting shrikes in Dodge County (Canisteo Township), approximately 0.4 miles to the south of the Route A route width study area (see **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**). This observation is significant because the record occurred in an area predominated by row crop cultivation, which is the dominant land cover type throughout

the ROW and surrounding study area. Thus, there are points along the ROW that can be interpreted *via* desktop review of aerial photographs as potentially suitable shrike nesting habitat.

Table 34: State- and Federally-Listed Species in Dodge & Olmsted Counties, Minnesota that are within Route A Route Width Study Area

Common Name	Scientific Name*	Record within Route A ROW	Status	
			State	Federal
Prairie Bush-Clover	*Lespedeza leptostachya*	No	Threatened	Threatened
Northern Long-eared Bat	*Myotis septentrionalis*	No	Special Concern	Threatened
Leedy's Roseroot	*Rhodiola integrifolia* ssp. *leedyi*	No	Threatened	Threatened
Sullivant's Milkweed	*Asclepias sullivantii*	Yes	Threatened	--
Wood Turtle	*Glyptemys insculpta*	Yes	Threatened	--
Ozark Minnow	*Notropis nubilus*	No	Special Concern	--
Ellipse	*Venustaconcha ellipsiformis*	No	Threatened	--

The Route A route width study area encompasses a single MNDNR designated ecological/zoological assemblage of concern (*i.e.*, MNDNR designated Native Plant Communities) (**Table 35**; refer to **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**).

Table 35: Ecological and Animal Assemblages: Dodge & Olmsted Counties, Minnesota within the Route A Route Width Study Area

Name	Type of Assemblage	Acreage within Route A Route Width Study Area	Acreage within Route A ROW
Wet-Mesic Hardwood Forest (southern)	Ecological	34.80	--

Impacts and Mitigation

As indicated in **Section 5.8.8**, the Route A alignment and ROW span a landscape that intersects few biodiverse habitat assemblages. Based on land cover data and review of NHIS data, the probability that the ROW will intersect and subsequently impact federally threatened or endangered species is relatively low, particularly for the listed flowering plants noted above.

Impacts to northern long-eared bats are not anticipated. No known northern long-eared bat roost trees are known to exist within the ROW. The USFWS has published tree clearing recommendations to mitigate for direct impact to this species (USFWS 2015). Should the Applicant identify or receive information indicating a roost tree is near or within the Route A route width study area, no tree clearing would occur within 150 feet of a known roost between June 1 and July 31 in keeping with the USFWS 4(d) rule for this species within the white nose syndrome zone, which includes all of Minnesota (USFWS 2018e).

The Route A ROW is a greater distance away from the single, known active bald eagle nest in the vicinity of the Route A route width study area than the established 660-foot construction avoidance area (please refer to USFWS 2007). Additionally, APLIC guidance will be utilized to determine suitable line marking procedures to prevent avian collision.

Regarding state listed TES, NHIS data indicate that remnant populations of Sullivant's milkweed could be present in roadside ditches. The Applicant will coordinate with MNDNR regarding any appropriate roadside construction and heavy equipment usage BMPs as it pertains to this species. Other more expansive native prairie sites are not known to occur along the ROW, and if sites are identified, electric transmission spanning design would be implemented to the extent practicable to avoid direct impacts to such sites.

Wood turtles may be present within portions of the Route A route width study area, particularly in aquatic areas. The highest risk to impacting this species may occur during the construction of the Project at which time there is a higher potential for construction equipment and staff to be in the vicinity of wood turtle habitat. The Applicant will coordinate with the MNDNR and

implement requested BMPs, as appropriate to avoid potential impacts to this species The operation of the Project is not likely to impact wood turtles as the species will be able to continue utilization of habitat within the permanent ROW, if present.

Since state endangered loggerhead shrikes nest in low height profile vegetation communities, remnant suitable habitat may be present and MNDNR will be consulted for existing BMPs in the event that territorial and/or nesting birds are discovered occupying the ROW at the time of construction.

Strictly aquatic species, specifically the Ozark minnow and ellipse, are not likely to be impacted by the construction and operation of Route A. Direct impacts to aquatic features will not occur from the construction of the Project as all support structures will be located outside of the OHWM and the associated 50 foot setbacks from MN public watercourses, as required (see **Section 5.8.6**). Indirect impacts from erosion and sedimentation will be mitigated through the implementation of BMPs as described in **Section 5.8.6**.

Finally, the Route A ROW avoids existing native plant communities delineated by MNDNR. Thus, impacts will not occur to MNDNR designated native plant communities.

(b) *Natural Resource Sites*

As indicated previously in **Section 5.8.8**, MBS identifies three *Sites of Biodiversity Significance* that are located completely within and/or partly overlap the Route A route width study area (Dodge County only; MNDNR 2014; see **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**).

Two of these sites overlap the Route A ROW.

Table 36: MBS Sites of Biodiversity Significance Crossed by Route A

Site Name	Within Route A ROW?	Within Route A Route Width Study Area?	Existing Powerlines Present	Biodiversity Significance Rating
Ashland 21-22	Yes, in one location	Yes	No – But One Line Adjacent	Below
Canisteo 19	Yes, in one location	Yes	No	Below
Canisteo 23	No	Yes	No	Moderate

Table 37 summarizes the Route A ROW in relationship to nearby rare and unique features. In general, the ROW is situated to avoid such known features that are scattered across this agricultural landscape.

Table 37: Summary of Environmental Sites for Route A Study Area

Environmental Site Type	Total
Number of MBS Biodiversity Sites Crossed by Route Alignment	1
Number of MBS Biodiversity Sites Crossed by Route Width Study Area	3
Number of WMAs in Route Width Study Area	0
Number of WMAs within 1-mile of Route Width Study Area	2
Number of WMAs within ROW	0
Lengths (ft) of WMAs over 1,000 ft that are Within ROW	0
Number of SNAs within 1-mile of Route Alignment	0
Number of State Parks within 1-mile of Route	0
USFWS Easements within 1-mile of Route Width Study Area*	1
Federal-listed Species Observations within Route Width Study Area	0
State-listed Species Observations within Route Width Study Area**	3
State-listed Species Observations within ROW**	2
State-listed Species Observations within Alignment**	2
State-listed Species Observations within 1-mile of Route Width Study Area**	8
Total Unique Species Observed within 1-mile of Route Width Study Area**	4

** Farm Service Agency Interest of Minnesota.*

*** Only species listed as Endangered or Threatened are included.*

Impacts and Mitigation

To the greatest extent possible, a majority of sensitive natural resources were avoided during Route A ROW planning. The Applicant will coordinate closely with MNDNR and USFWS, as appropriate, to develop BMP measures to minimize or mitigate impacts to sensitive resources.

Overall, no adverse impacts to rare or unique resources, such as direct take or disturbance, are anticipated through construction of the Project. Within Olmsted County, a portion of the Route A alignment runs parallel to an existing electric transmission line, subsequently reducing new vegetation fragmentation impacts. Through the vast majority of the ROW, existing vegetation types would remain the same following Project construction.

Some disturbance to wildlife likely will occur during construction. The Applicant will coordinate with applicable agencies for guidance on appropriate avoidance and/or mitigation steps.

6.0 ENVIRONMENTAL INFORMATION: ROUTE B

6.1 Environmental Setting

Route B is located in southeastern Minnesota within Dodge and Olmsted counties, approximately 9 miles west of Rochester and 71 miles south of Minneapolis, respectively. The Route B route width study area is dominated by cropland and a moderately extensive network of agricultural ditches and intermittent and ephemeral streams, many of which support herbaceous riparian buffers. The general topography of the Route B route width study area is described as undulating, rolling relief with approximate elevations between 1,206 and 1,347 feet above MSL. Route B generally slopes east and the northeastern portion of the route parallels Salem Creek, a tributary of the Zumbro River that eventually flows to the Mississippi River.

Ecoregion mapping data from the EPA indicates that the majority of the Route B route width study area is located within the Eastern Iowa and Minnesota Drift Plains ecoregion (Level IV) of the Western Corn Belt Plains ecoregion (Level III), while a small section of the Route B route width study area near its eastern terminus occurs within the Rochester/Paleozoic Plateau Upland ecoregion (Level IV) of the Driftless Area ecoregion (Level III) (USEPA 2015). The Western Corn Belt Plains ecoregion is characterized by fertile undulating plains overlain by glacial tills with scattered stream systems, and is dominated by row crops and some pasture. The Driftless Area ecoregion is characterized by rolling, older loess covered plains with row crops and some pasture (USEPA 2015).

According to the MNDNR ECS, the Route B route width study area is located within the Eastern Broadleaf Forest Province, a transition zone between the western prairies and eastern mixed conifer/deciduous forest (MNDNR 2018). This Province is further divided into Sections and Subsections. The Route B route width study area primarily occurs within the Minnesota and Northeast Iowa Morainal Section (222M), characterized by deciduous forest, woodland, and prairie in a hummocky morainal landscape, and the Oak Savanna Subsection (222Me), which was historically covered by bur oak savanna, patches of tallgrass prairie, and maple-basswood forest on gently rolling hills. A small portion of the Route B route width study area is within the Paleozioc Plateau Section (222L), characterized by highly eroded bluffs and valleys, and the Rochester Plateau Subsection (222Lf), an area of transition from rolling plateau to dissected landscapes (MNDNR 2018).

Predominant features along Route B include rural residences, farmsteads, agricultural buildings, cropland, Welsh Equipment, Inc., snowmobile trails, Salem Creek, the North Fork of Salem Creek, Cascade Creek, several MNDNR public watercourse crossings, NWI wetlands, Native Plant Communities, and the Canisteo 9 and Canisteo 29 Sites of Biodiversity Significance. There are no WMAs, WPAs, SNAs, or WRP conservation easements within the Route B ROW or Route B route width study area. Though not within the Route B route width study area, the

Bud Jensen WMA is approximately 0.20 miles northwest of the boundary in the general vicinity of Salem Creek.

6.2 Land Cover

Land use, vegetative cover and land form classification in Minnesota follows the National Hierarchical Framework of Ecological Units (McNab and Avers 1994). Ecological land classifications are used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features. The Route B route width study area occurs within the Rochester Plateau and Oak Savannah Subsections of the Eastern Broadleaf Forest Province.

Historically, the dominant vegetative communities within these Subsections were tallgrass prairie and bur oak savanna; however, the majority of this area is now heavily farmed. Tallgrass prairies are identified by the presence of native grasses such as little bluestem, big bluestem, Indiangrass, and switchgrass as well as an assortment of herbaceous forbs. Oak savannas are identified by a low density of canopy cover, usually less than 50%. Common vegetation associated with bur oak savannas includes bur oak, big bluestem, switchgrass, Indiangrass, and numerous forbs. The dominant land cover encompassed by the Route B ROW is cultivated crops, most notably corn varieties and soybean. Pasture grasses, such as alfalfa and winter wheat account for a smaller percentage of the land cover.

In addition, Minnesota has classified 39 distinct agroecoregions, based on a specific combination of soil type, landscape, climatic features, and land use. Agroecoregions are landscape units with relatively uniform crop productivity, climate, geologic parent material, soil drainage, and slope characteristics. The Route B route width study area is encompassed by the Level Plains, Undulating Plains, and Rochester Plateau agroecoregions (University of Minnesota and MDA 1998). The Level Plain agroecoregion is comprised of fine-textured, poorly drained soils with row crop production on relatively flat topography. The Undulating Plains agroecoregion is comprised of well-drained, fine-textured soils developed on moderately steep slopes with a mixture of row crops and livestock/dairy production. The Rochester Plateau agroecoregion is composed of well-drained, fine-textured loessial soils developed on moderately steep slopes in karst with a mixture of row crops and livestock/dairy production.

The 2011 National Land Cover Database – Land Use-Land Cover dataset (Homer et al. 2015) indicates that the dominant land use-land cover types within the Route B ROW are: Cultivated Crops, Developed-Open Space, and Developed-Low Intensity Areas. **Table 38** presents the total acreage of each land use-land cover type encompassed by the Route B ROW. Refer to **Map 1 (National Land Cover Database Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing land cover for Route B.

Table 38: Land Cover Along Route B

Route B Impacts	Total
Route Length (miles)	26.31
150-foot ROW (acres)	400.65
Land Cover	
Cultivated Crops in ROW (acres)	292.68
Grassland/Herbaceous Areas in ROW (acres)	6.70
Deciduous Forest Area in ROW (acres)	0.11
Developed, Open Spaces Areas in ROW (acres)	84.31
Developed, Low Intensity Areas in ROW (acres)	14.75
Developed, Medium Intensity Areas in ROW (acres)	1.85
Developed, High Intensity Areas in ROW (acres)	0.25

Impacts and Mitigation

The dominant land cover within the Route B ROW is cultivated crops, totaling approximately 292.68 acres out of a total of 400.65 acres (73.05%). No direct effect on CREP parcels are anticipated as none were identified within the Cultivated Crops land cover. Digital data for CRP lands were unavailable at the time of this writing.

Short and long-term effects on land that is used for agricultural crop production will largely remain unchanged as crops will be able to be planted up to the transmission line. The Applicant will coordinate with the landowners on the timing of clearing and construction activities to minimize adverse effects on the timing and planting of crops. Changes in agricultural equipment maneuvering routes adjacent to the generation tie line and associated structures will be required, but should have a nominal effect on overall production.

6.3 Soils

The Digital General Soil Map of the United States (STATSGO2) is a broad-based inventory of soils and non-soil areas that occur in a repeatable sequence across the landscape (NRCS 2018). These soil associations have been mapped at a scale of 1:250,000 in the continental U.S. The dominant soil associations within the Route B route width study area include Skyberg-Maxfield-

Kasson, Skyberg-Maxfield-Clyde, Readlyn-Racine-Maxfield-Kasson, Ostrander-Maxfield-Kenyon, Racine-Maxfield-Floyd, Otter-Mt.-Carrol-Joy, Rockton-Channahon-Atkinson, Waukee-Spillville-Radford-Lawler, and Port Bryon-Garwin. All soil associations have been assigned a Capability Class, which are categories of soils generally grouped by limitations and restrictions on their use. Soil associations occurring within the Route B route width study area have been assigned Capability Classes of 1, 2, 3, 5, and 6. Class 1 soils have few restrictions that limit their use. Class 2 soils have moderate limitations that can require moderate conservation practices or limit plant choices. Class 3 soils have severe limitations that require special conservation practices, and/or limit plant choices, or both. Class 5 soils are subject to little or no erosion but have other limitations, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat, and make them impractical to move. Class 6 soils have severe limitations which make them unsuitable for cultivation and restrict their functional use mainly to pasture, rangeland, forestland, or wildlife habitat (USDA 2018). Refer to **Map 2 (Soils Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing soil associations throughout Route B.

According to the general soil data for Dodge and Olmsted Counties (USDA 2018), the dominant soil series found within the Route B ROW are considered to be silty, silty clay loam, or loam, are used for agricultural purposes, and are well to poorly drained. The majority of the Route B ROW is classified as Prime Farmland, Prime Farmland if drained, or Farmland of Statewide Importance according to the soil surveys. Refer to **Table 39** for additional information regarding farmland classifications within the Route B ROW. Refer to **Map 3 (Prime Farmland Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing farmland classifications along Route B.

Table 39: Farmland Classifications Along Route B

Route B	Total
ROW Acres	400.65
Prime Farmland within ROW (acres)	235.32
Percent of ROW that Crosses Prime Farmland	58.74
Prime Farmland if Drained within ROW (acres)	155.58
Percent of ROW that Crosses Prime Farmland if Drained	38.83
Farmland of State Importance within ROW (acres)	2.31
Percent of ROW that Crosses Farmland of State Importance	0.58
Not Prime Farmland within ROW (acres)	7.44

Route B	Total
Percent of ROW that Crosses Not Prime Farmland	1.86
ROW Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance (acres)	393.21
ROW Percent Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance	98.14

Impacts and Mitigation

The Route B ROW will cross 393.21 acres of farmland classified as Prime Farmland, Prime Farmland if Drained and/or Farmland of Statewide Importance. Additionally, according to the 2011 National Land Cover Database, the Route B ROW crosses approximately 293 acres of agricultural land (refer to **Section 6.2**). As such, a portion of prime farmland will be taken out of agricultural production due to the development of Route B. However, the impacts will not have a meaningful impact on total prime farmland within the state of Minnesota. Soil compaction and localized soil erosion may occur during the clearing and construction of the Route B ROW. In addition, potential soil impacts may result from the excavation, stockpiling, and redistribution of soils. Impacts would be short-term and minor in nature and would be mitigated through the proper use and installation of BMPs, such as minimizing the number of vehicles and protection and maintenance of topsoil, during ROW clearing and generation tie line construction. Landowners will be compensated accordingly for any localized soil compaction or erosion that may occur. Refer to **Section 6.6** for additional information related to agricultural impacts.

6.4 Linear Feature Sharing

Linear corridor feature sharing is used to minimize natural resource disturbances to the adjoining landscape which reduces the overall impacts of a linear feature. The proposed Route B alignment parallels existing transmission lines, roadways, and field lines to the greatest extent possible while also addressing other site specific resource and landowner issues. Of the 26.3 miles of proposed transmission line, 19.8 miles (75.4%) follow linear features. Existing linear overhead transmission features within the Route B route width study area include two Northern State Power Company 345-kV transmission lines (Byron to Pleasant Valley and Byron to North Rochester); two SMMPA 161-kV transmission lines (Al Corn to Byron and Cascade Creek to Byron); the Rochester Department of Public Utilities Byron to Maple Leaf 161-kV transmission line; and the SMMPA Byron to Kasson 69-kV transmission line. Route B contains Minnesota State Highway 56 as well as smaller county and local roads.

As currently planned, the Route B alignment would share approximately 0.1 mile of existing transmission lines, approximately 13.9 miles of road ROWs, and approximately 6.8 miles of field lines (see **Table 40**).

Table 40: Linear Feature Sharing for Route B

Linear Feature Sharing – Type	Total
Length along Existing Transmission Alignment (miles)	**0.1**
also along roads (miles)	0
also along field lines (miles)	0
Length Not Along Existing Transmission Alignment	**26.2**
but along roads (miles)	13.9
but along field lines (miles)	6.8
No Linear Feature Sharing (miles)	6.5
Total Linear Feature Sharing (miles)	19.8
Total Linear Feature Sharing (percent)	75.4%

Impacts and Mitigation

Opportunities for linear feature sharing have been utilized as much as practicable along Route B alignment. The proposed Route B alignment is not expected to impact linear features.

6.5 Human Setting

6.5.1 Public Health and Safety

Emergency management response services within Route B are provided by the Dodge County Sheriff, DCEM services, Olmsted County Sheriff, and OEMD. Dodge and Olmsted counties have specific plans for preparedness, response, recovery, and mitigation, and work closely with local, state, and federal officials to educate, prepare for, respond to, and recover from disasters and large scale emergencies. Emergency response centers are located nearby in the City of Rochester for Olmsted County and in the City of Mantorville for Dodge County, and dispatch all 911 calls for their respective counties, including fire, medical, and police emergencies. The Applicant will work closely with DCEM and OEMD to ensure adequate assignment of 911 addresses for coordination of emergency responses. Fire and police departments servicing Route B are a mix

of local, county, and volunteer departments. Hospitals and other medical facilities are not within the Route B route width study area but can be found in the cities of Byron, Kasson, and Dodge Center while world-class medical facilities are in nearby Rochester.

The Minnesota SCIP was created to maximize interoperability between public safety/service agencies as part of the Department of Homeland Security requirements. The Minnesota SCIP has made significant progress towards enhancing emergency communication with the deployment of a statewide, standards-based communication system known as the ARMER (Minnesota Department of Public Safety 2015). ARMER has over 300 tower sites scattered across Minnesota, six of which are located in the same counties as the Route B ROW. Dodge County has one tower located near Dodge Center, and Olmsted County has five towers: New Haven, Viola, Gugenheim, Rock Dell, and Pleasant Grove.

Impacts and Mitigation

Construction activities and the temporary increase in associated workers are not expected to adversely affect public health or emergency services due to the limited number of construction workers and short duration of activities. Project construction will require different worker skill sets for different aspects of project construction and installation. The specialized nature of the skill sets and short duration of construction activities would preclude any long-term worker relocation to the area. Construction activities may require additional resources for traffic control and law enforcement.

Route B is not expected to impact ARMER towers due to their distance from the Route B route width study area. The Applicant will coordinate with ARMER operators, as appropriate, to ensure operations and signal interference will not be impacted.

Route B will be designed in accordance with state, local, NESC, and DCW standards for ground clearance, crossing utilities clearance, building clearance, strength of materials, and ROW widths. DCW will ensure construction crews and/or contract crews will comply with local, state, and NESC standards regarding facility installation and standard construction practices. Further, OSHA measures will be adhered to by construction, operations, and maintenance crews. DCW and industry safety procedures will be followed once Route B is installed and is in operation.

DCW will use industry standard protective measures to safeguard the public in the event of an accident. In the event of a structure or conductor falling to the ground, protective equipment would de-energize the generation tie line. Local residents would be contacted, as necessary, if nearby structures are subject to further protective measures. Should landowners identify safety concerns, DCW will investigate and take appropriate corrective action. Other safety concerns not identified by DCW, but raised by landowners, will be investigated and addressed. With these

safeguards and protective mechanisms, no significant impacts to public health and safety are anticipated.

6.5.2 Commercial, Industrial, and Residential Land Use, Displacement

The proposed Route B ROW extends from the Project collector substation in western Dodge County eastward into Olmsted County, terminating at the Byron POI Substation. This region is rural in nature, with the dominant land use being agricultural crop and dairy production. Rural residences, farmsteads, and agricultural buildings are scattered throughout the landscape (see **Table 41** and **Appendix C (Detailed Aerial Maps)**) with minimal commercial and industrial facilities, including Welsh Equipment, Inc., a used truck and equipment facility in the western portion of the Route B ROW.

The Dodge County 2001 Comprehensive Plan describes sustainable goals for the county's economic development. DCW understands that Dodge County is in the process of updating its Comprehensive Plan during 2018. The overall vision or focus of Dodge County citizens is a continued high quality of life for all residents of Dodge County with long term goals being citizen participation and cooperation, protecting and preserving agricultural land, rural tax reform and job skills training that support public education and economic development, greater public investments in County infrastructure, livable community design as the County experiences further growth, conservation of natural resources, and sustainable development (Dodge County Planning Commission 2001).

The Rochester-Olmsted Planning Department provides planning and related services to the City of Rochester, Olmsted County, and smaller cities and townships within Olmsted County. The Olmsted County Planning Advisory Commission is currently in the process of updating the 2011 Olmsted County Land Use Plan.

One residence is located within 75 feet of the Route B alignment, six residences are found within 150 feet of the Route B alignment, and a total of 31 residences are found within 500 feet of the Route B alignment (see **Table 41** and **Appendix C (Detailed Aerial Maps)**). Smaller structures such as outbuildings, grain bins, machinery storage sheds, and/or livestock holding pens may be located within 500 feet of the Route B alignment. No displacement of residences is planned. Should the removal or relocation of non-residential buildings be a consideration, DCW will work with landowners on a case-by-case basis to come to a voluntary agreement on the removal of relocation.

Table 41: Proximity of Residences to Route B Application Alignment

Proximity (feet)	Number
Residences 0-75	1
Residences 76-150	5
Residences 151-300	17
Residences 301-500	8
Total Residences	**31**
Density (homes/mile)	**1.18**

Impacts and Mitigation

DCW is committed to designing a project that comports with the overall goals of the communities to conserve farmland and natural resources, support economic and sustainable development, and provide a positive benefit to the citizens of Dodge and Olmsted counties. The Route B ROW would be compatible with the rural, agricultural character of the counties and the goals set forth in the respective county comprehensive plans. A more detailed analysis of agricultural impacts can be found in **Section 6.6.1**.

The Route B ROW is compatible with current zoning designations across Dodge and Olmsted counties. As a result, the Route B ROW is not anticipated to have any impact on planning and zoning within in these counties.

Existing linear features and residences were incorporated into the design of the Route B ROW in order to minimize impacts to commercial, industrial, and residential properties. No impacts to commercial or industrial development are expected as the Route B ROW is generally rural in character. One residence is found within 75 feet of the Route B alignment, but outside of the Route B ROW, and only six residences are found within 150 feet of the Route B alignment. Therefore, displacement of residences is not anticipated along the Route B ROW.

6.5.3 Sound

Refer to **Section 5.5.3** for information related to sound. Discussion on sound related to Route B is the same as presented for Route A except that there are 31 sensitive sound receptors located within 500 feet of the Route B alignment whereas there are 29 sound receptors within 500 feet of the Route A alignment. However, one of the sound receptors along the Route B alignment is located approximately 46 feet from the alignment.

Impacts and Mitigation

Refer to **Section 5.5.3** for information regarding potential temporary and permanent impacts resulting from the Project. Again, discussion on sound related to Route B is the same as presented for Route A except that there are 31 sensitive sound receptors located within 500 feet of the Route B alignment whereas there are 29 sound receptors within 500 feet of the Route A alignment. Additionally, there is one residence that is located approximately 46 feet from the Route B alignment. The maximum sound calculated at five feet above ground at this location is expected to be between 23.6 dBA (L_{50} fair) and 48.6 dBA (L_{50} rain) which is below the MPCA state noise standard.

6.5.4 Radio and Television Interference

Refer to **Section 5.5.4** for information related to radio, television, cellular device, and GPS interference. Discussion on radio, television, cellular device, and GPS interference related to Route B is the same as presented for Route A.

Impacts and Mitigation

The construction and operation of the Project is not anticipated to result in significant permanent or temporary radio, television, cellular device, or GPS interference. Refer to **Section 5.5.4** for information regarding potential temporary and permanent impacts resulting from Route B.

6.5.5 Aesthetics

Aesthetic quality and appeal of a region generally derive from the terrain, natural features (*e.g.*, lakes, rivers, ponds, etc.), native flora, and cultural features that define the landscape. Individual observers will have differing opinions on the aesthetic appeal of a region and impacts that may alter the quality. Those likely to be viewing the proposed Project include permanent observers (residents) and temporary observers (motorists, tourists, or recreationalists passing by or using the area intermittently). Residents along the Route B ROW are expected to have a higher sensitivity to the potential aesthetic impacts than temporary observers as they will look at the Project more frequently than those individuals periodically passing through the area.

The Route B route width study area crosses through two Level 3 Ecoregions: the Western Corn Belt Plains Ecoregion and the Driftless Area Ecoregion. Primarily, the Route B route width study area is located in the Western Corn Belt ecoregion. The topography in this ecoregion is characterized by nearly level to gently rolling plains. Historically, the region was covered with tallgrass prairie, but today land cover is dominated by cropland and pasture. A small portion of the Route B route width study area lies in the Driftless Area Ecoregion. The varying topography of Driftless Area Ecoregion easily distinguishes it from the surrounding Ecoregions, as it consists of loess-capped plateaus, deeply dissected by streams. The major land uses in this Ecoregion are livestock and dairy farming (Omernik and Gallant 1988).

Viewsheds in the area are generally long and open with only small scattered areas where the view from a location would be blocked by vegetation, topography, or existing structures. The Route B route width study area viewshed currently includes rural residences, farmsteads, agricultural buildings, cropland, OHE transmission and distribution lines, a railroad, wind turbines, and limited commercial and industrial development. Snowmobile trails, discussed in further detail in **Section 6.5.8**, are present within the Route B route width study area. In addition, State Highway 56 and numerous county roads traverse the Route B route width study area, which occurs within a man-made environment dominated by agriculture and associated infrastructure. U.S. Highway 14 crosses the Route B route width study area near its northern terminus, just west of the town of Byron. The viewshed also includes natural features which remain within the landscape, including Salem Creek, North Fork Salem Creek, and associated tributaries, wetlands, floodplains, and wooded riparian areas; numerous smaller watercourses and drains; and scattered woodlots.

Impacts and Mitigation

Those likely to be most impacted by the Project are the residents of Dodge and Olmsted counties and the recreationalists using the designated snowmobile trails. The proposed Project will alter the visual appearance of the Route B route width study area by adding additional vertical and horizontal man-made structures to the existing landscape. The height of the proposed transmission structures will be dependent on the terrain and span length. Transmission structures will be installed at the shortest height possible while maintaining all possible clearances. Although the Route B alignment only parallels 0.1 mile of existing OHE, the proposed Project will not create a new feature type within the landscape as existing OHE transmission and distribution lines are present within the landscape surrounding the Route B alignment. The Applicant sited the Project in coordination with landowners to minimize visual impacts, address aesthetics, and to utilize natural screening to provide a buffer between the infrastructure and observers, where feasible.

6.5.6 Socioeconomic

Socioeconomic data was gathered for Ripley, Ashland, Canisteo, Vernon, Hayfield, and Mantorville townships in Dodge County and for Kalmar Township, Salem Township, and Byron City in Olmsted County to ascertain the estimated socioeconomic conditions present within the Route B route width study area. Data was also acquired for Dodge County, Olmsted County, and the State of Minnesota for comparison. The socioeconomic data was gathered from the U.S. Census Bureau 2016 population estimates and the 2012-2016 American Community Survey 5-Year Estimates. Although 2017 population estimates are available, the 2016 population estimate was used to correlate with the 2012-2016 American Community Survey 5-year estimates available for the median household, unemployment rate, and poverty rate data.

According to the U.S. Census Bureau 2016 population estimates, the total population of the townships through which the Route B route width study area extends is approximately 11,875 people. This accounts for approximately 0.22% of the total population of the state of Minnesota. Of these 11,875 individuals, approximately 99% are Caucasian with total minorities accounting for approximately 3% (U.S. Census Bureau 2018). Refer to **Table 42** below detailing additional population characteristics.

Table 42: Population Characteristics – Route B

Location	Total Population[1]	Caucasian[1]	Black or African American[1] *	Asian[1]	Other[1]	Hispanic[1]	Total Minority
Route B[2]	11,875	99.3%	0.3%	0.3%	0.7%	1.3%	2.6%
Dodge County	20,361	97.7%	1.2%	1.0%	1.6%	4.9%	8.7%
Olmsted County	150,104	87.4%	6.3%	6.8%	1.8%	4.6%	19.5%
State	5,450,868	86.8%	6.9%	5.3%	3.9%	5.1%	21.2%

[1]Source: U.S. Census Bureau 2012-2016 American Community Survey 5-Year Estimates (U.S. Census Bureau 2018).
[2] Includes Ripley, Ashland, Canisteo, Hayfield, Vernon, and Mantorville townships in Dodge County and Kalmar Township, Salem Township, and Byron City in Olmsted County.

According to the 2012-2016 American Community Survey 5-Year Estimates, the median household income for the counties, townships, and city along the Route B route width study area are higher than the state average of $63,217, with a range of $64,792 to $109,722. In addition, unemployment rates and the percent below poverty are generally better within the counties, townships, and city along the Route B route width study area than the state averages of 4.8% and 10.8%, respectively (U.S. Census Bureau 2018). Refer to **Table 43**, below, for additional information regarding economic characteristics.

Table 43: Economic Characteristics – Route B

Location	Median Household Income[1]	Unemployment Rate[1]	Percent of Population Below Poverty[1]
Dodge County	$68,718	3.3%	6.6%
Ripley Township	$64,792	10.3%	7.4%
Ashland Township	$82,500	2.0%	0.0%
Canisteo Township	$89,167	2.2%	0.3%
Mantorville Township	$109,722	2.3%	1.6%
Vernon Township	$88,523	3.7%	6.8%
Hayfield Township	$105,625	2.6	2.3%
Olmsted County	$69,308	4.2%	9.2%
Kalmar Township	$95,000	7.3%	4.6%
Salem Township	$78,700	1.7%	2.9%
City of Byron	$82,109	1.9%	3.0%
Minnesota	$63,217	4.8%	10.8%

[1]Source: U.S. Census Bureau 2012-2016 American Community Survey 5-Year Estimates (U.S. Census Bureau 2018).

According to the ACS 2012-2016 estimates, educational services, health care and social assistance accounted for 24.8% of jobs in Minnesota, followed by manufacturing at 13.5% and retail trade at 11.2%. For Dodge County, educational services, health care, and social assistance accounted for 32.5% of jobs followed by manufacturing at 14.0% and retail trade at 8.9%. Olmsted County primarily consists of educational services, health care and social assistance jobs, which accounted for 45.3% of Olmsted County (likely related to the Mayo Clinic located in Rochester), followed by retail trade at 10.7%, and manufacturing at 8.4% (U.S. Census Bureau 2018).

Impacts and Mitigation

Construction of the Project is not anticipated to significantly impact the permanent population size or demographics of the counties, townships, or city that the Route B route width study area traverses as the Project will not create any permanent jobs. However, the population size and demographics may temporarily increase and change with the addition of construction personnel.

During construction, approximately 30-40 temporary construction personnel will be required. Most, if not all, of these temporary construction personnel will likely be from outside of the region and only remain in Dodge and Olmsted counties over the duration of the Project (approximately 5-7 months). This temporary increase in population is likely to result in a small financial gain for the local economy, as the Project and its personnel will utilize products and services from a variety of local businesses, including infrastructure maintenance services, industrial supplies, and hospitality services. No additional socioeconomic impacts are anticipated through the development of the Project.

6.5.7 Cultural Values

The cultural values associated with the Route B route width study area are likely related to the agriculturally dominated landscape. It can be assumed that the protection of land to allow for the continuation of farming for local residents is of the utmost importance in Dodge and Olmsted counties. This is supported by the Dodge County Board Mission Statement: "To efficiently operate within a budget while providing excellent service, maintaining a rural character, and preparing the county to operate effectively for years to come." (Dodge County Board 2013).

Impacts and Mitigation

Cultural values are not expected to be impacted by the construction of the Project. The Project will not alter the rural character of the Route B route width study area nor will it substantially influence the continuation of farming for local residents. While a negligible amount of land will be taken out of agricultural production (approximately 6 feet-12 feet diameter), landowners may continue to plant crops and graze livestock near the generation tie line structures. Farming activities may be temporarily impacted during the construction of the Project, but the Applicant will work closely with each landowner to ensure these impacts are minimized and appropriately mitigated.

6.5.8 Recreation

Dodge and Olmsted counties provide a variety of recreational opportunities including hiking, fishing, hunting, camping, nature viewing, and snowmobiling. Dodge County operates four traditional recreational parks and one campsite at Creek Park. In addition, Dodge County owns and maintains 4.6 miles of hiking trails and the Wasioja Seminary Park, a historic site. Olmsted County offers two camping locations, several parks, Oxbow Park & Zollman Zoo, and extensive miles of both hiking and skiing trails.

None of the aforementioned parks, campsites, or hiking trails are located within the Route B route width study area. However, two designated snowmobile trails occur within the Route B ROW and route width study area, the Kasson-Mantorville Trails and the Dodge County Trails. The Kasson-Mantorville Trails cross the Route B ROW at one location and the Dodge County Trails cross the Route B ROW at one location. No WMAs are located within the Route B ROW or

Route B route width study area. One MNDNR WMA (Bud Jensen WMA) is located within one mile of the Route B route width study area. The Bud Jensen WMA is a publically accessible area that provides good opportunities for wildlife observation and hunting (MNDNR 2018). A map showing the relationship of Route B to recreational uses is included as **Map 4 (Public Land Ownership and Recreation Map)** in **Appendix H (Environmental Feature Maps).**

Impacts and Mitigation

Route B could impact hunting activities on private property and snowmobiling activities on the Kasson-Mantorville Trails and Dodge County Trails. Construction sounds and equipment may temporarily relocate wildlife from an area, negatively impacting viable hunting locations. Construction sounds and equipment may also temporarily diminish the aesthetic quality and scenery of the snowmobile trails. The Project may also require the temporary closing or relocating of part of the snowmobile trails or cutting off access to hunting locations to ensure the safety of construction personnel and recreationalists during construction activities. These aforementioned impacts will be temporary as they should only occur during the construction of the Project. The Applicant has initiated coordination with the snowmobile clubs and will continue to coordinate with the clubs regarding the placement of pole structures in the vicinity of the trails and construction timing. Following the construction of the Project, the construction equipment will be removed and wildlife should return as normal. However, recreationalists using the snowmobile trails may be impacted by the change is aesthetics when they are in proximity to the generation tie line.

6.5.9 Public Services

Emergency services, water and wastewater services, schools districts, electric utilities, and other public services and facilities are located in or near the Route B route width study area. These public services and infrastructure are discussed in more detail below.

(a) *Police, Fire, and Ambulance Services*

Emergency response services within the Route B route width study area are provided by local law enforcement and emergency response agencies located in nearby communities. Within the Route B route width study area, law enforcement will likely be provided by the Dodge County Sheriff, Olmsted County Sheriff, and the Byron Police department. Additional assistance may be provided by other local municipal police departments. Within Dodge and Olmsted counties, there are several fire departments and ambulance providers to support emergencies within the Route B route width study area.

(b) *Hospitals*

Several hospitals and medical facilities are available within Dodge and Olmsted counties including the Kasson Mayo Family Practice Center, Field Crest Care Center, Hayfield Spine

Care Center, Olmsted Medical Center-Byron, and the Mayo Clinic and associated branches. However, hospitals and other medical facilities are not located within or near the Route B route width study area.

(c) *Water and Wastewater Services*

Within the Route B route width study area, water and wastewater services are expected to be provided through privately-owned water wells and septic systems. Municipal water and sewer are likely present within the small portion of the Route B route width study area that crosses the City of Byron.

(d) *School Districts*

The Route B route width study area includes three school districts within Dodge County (Kasson-Mantorville, Triton, and Hayfield) and one school district within Olmsted County (Byron). However, none of the school buildings are located within the Route B route width study area.

(e) *Electric Utilities*

The Northern State Power Company and the SMMPA provide electricity within the Route B route width study area. Distribution and transmission infrastructure of these electric providers is present within and near the Route B route width study area. Additionally, the Rochester Department of Public Utilities has an electric transmission line within the Route B route width study area. The Applicant will work with the appropriate utility company, as necessary, to avoid potential impacts to electric utility infrastructure.

Electricity is also provided for the region through wind generation facilities. No wind farms are located within the Route B route width study area; however, one small wind farm owned by Garwin McNeilus, located east of State Highway 56, is located approximately 0.4 miles north of the Route B route width study area. Other wind farms may currently be proposed for construction or may begin construction following submittal of this application.

(f) *Other Public Services*

There are a wide variety of other public services provided in the area by Dodge County, Olmsted County, and the City of Byron. These services include environmental services, administrative services, planning and zoning department services, economic development organizations, veteran service offices, among many others. County and city departments throughout the communities spanning the Route B route width study area assist with snow removal, street maintenance, stormwater management, building maintenance, and sidewalks. Additionally, there are no pipelines within the Route A route width study area.

Impacts and Mitigation

Public services within the Route B route width study area are not anticipated to be permanently or significantly impacted by the construction and operation of the Project. The Applicant will work with other wind providers to ensure the Project will not impact any of the existing wind farms or those under construction, as appropriate. The Applicants will also utilize the Gopher State One-Call system to locate and mark all existing underground utilities prior to construction to avoid impacts on pipelines. Construction of the Project may require road closures for the safety of public and construction personnel. Road closures may temporarily impact the travel of public services, specifically emergency response services. Prior to construction, the Applicant will notify the appropriate local emergency services near the Project to minimize any potential impacts caused by the construction of the Project.

Construction of the project will also temporarily increase the population and workforce present within the vicinity of the Project. This increase in population may temporarily cause an increase in individuals requesting the use of public services or requiring assistance from emergency services. However, this minimal increase in population should not create the need for more public services than already exist. Therefore, impacts associated with a temporary increase in population are not anticipated.

In addition, the construction and operation of the Project is not anticipated to impact public infrastructure. The Applicant will work with public service providers to determine the location of public infrastructure to ensure impacts are avoided. The Applicant will coordinate with individual landowners to ensure the Project does not impact privately-owned septic systems and water wells, and with the Byron Public Works to ensure municipal services are not impacted, as appropriate.

6.5.10 Transportation

(a) *Roadways*

Existing road infrastructure within the Route B route width study area is similar to the Route A route width study area. The Route B route width study area primarily consists of paved and unpaved county and township roads that typically follow section lines. Unpaved two-track/dirt roads, likely used for farming and private access, are also present within the Route B route width study area. The two largest roadways within the Route B route width study area are U.S. Highway 14 and State Highway 56. U.S. Highway 14 is located near the eastern terminus, approximately 0.4 miles south of the Byron POI Substation and State Highway 56 is located approximately 5.9 miles southeast of the Project collector substation (see **Appendix B (County-Level Maps)**).

The MN/DOT AADT data can be used to determine traffic volumes within and around the Route B route width study area. Data was not available for all of the roads within the Route B route width study area and thus, only roads with data available are discussed further. Dodge County (U.S. Highway 14) has the highest AADT count with 17,200 vehicles per day, using 2015 data, while the lowest count was at CSAH 6 (680th St) with 60 vehicles per day, using 2013 data. The remainder of roads within the Route B route width study area contained traffic counts between 110 and 2,750 vehicles per day (MN/DOT 2015). Generally, traffic counts within the Route B route width study area are relatively low with a few main thoroughfares conveying most of the traffic. Due to the rural setting of the Route B route with study area, roads lacking AADT data likely also carry low traffic levels. Additional information regarding AADT data for the roads within the Route B route study width area is included in **Table 44**, below.

Table 44: AADT on County, State and US Highways, Roads, and Interstates Crossed or Paralleled by Route B

Road	County	AADT	Traffic Count Year	Distance Paralleled[1] (miles)
140th Ave	Dodge	Not Available	Not Available	--
15th Ave	Dodge	Not Available	Not Available	-
CSAH 5 (160th Ave)	Dodge	280	2013	--
660th St	Dodge	Not Available	Not Available	1.28
170th Ave	Dodge	Not Available	Not Available	1.0
CR W (670th St)	Dodge	40	2013	1.0
180th Ave	Dodge	Not Available	Not Available	1.99
CSAH 6 (680th St)	Dodge	170	2013	--
690th St	Dodge	Not Available	Not Available	1.0

Road	County	AADT	Traffic Count Year	Distance Paralleled[1] (miles)
State Highway 56	Dodge	2,750	2015	0.99
CR K (700th St)	Dodge	110	2013	2.99
200th Ave	Dodge	Not Available	Not Available	--
210th Ave	Dodge	Not Available	Not Available	--
CSAH 9 (220th Ave)	Dodge	1,000	2013	0.99
690th St	Dodge	Not Available	Not Available	0.52
230th Ave	Dodge	Not Available	Not Available	0.77
CSAH 6 (680th St)	Dodge	60	2013	--
240th Ave	Dodge	Not Available	Not Available	--
670th St	Dodge	Not Available	Not Available	--
CSAH 13 (250th Ave)	Dodge	1,100	2013	--
262nd Ave	Dodge	Not Available	Not Available	--
655th St	Dodge	Not Available	Not Available	--
650th Street	Dodge	Not Available	Not Available	0.26

Road	County	AADT	Traffic Count Year	Distance Paralleled[1] (miles)
CSAH 15 (270th Ave)	Dodge	750	2013	1.02
280th Ave	Dodge/Olmsted	Not Available	Not Available	--
U.S. Highway 14	Olmsted	17,200	2015	--
MSAS 101 (Frontage Road)	Olmsted	1,750	2014	--
4th Street NW	Olmsted	Not Available	Not Available	0.11

Source: MN/DOT AADT GIS Shapefile (MN/DOT 2015)
[1] "--"Indicates road is crossed by the Route B ROW

(b) *Railroads*

There is one active railroad within the Route B route width study area, near the eastern terminus of the Route B alignment and it is owned by DM&E. The Route B alignment would cross the DM&E railroad approximately 0.18 miles southwest of the Byron POI Substation (see **Appendix B (County-Level Maps)**).

(c) *Airports and Airstrips*

The Route B alignment crosses south of the TOB within approximately 2.9 nautical miles of the nearest runway end. Similar to the Route A alignment, it is expected that many structures in Route B would require filing notice to the FAA prior to construction. Based on DCW's internal evaluation, none of the structures in the Route B alignment would penetrate any OIS associated with TOB at 135 feet agl.

As described in **Section 5.5.10**, the Capital Airspace Group study identified a potential new runway with instrument procedure proposed for TOB, which would affect the western end of the Route B alignment. As the wind farm in the instrument approach area already contains wind turbines that are greater than 300 feet agl, the OIS for an instrument procedure in this area would have to take the existing wind turbines into account as the controlling obstacle, and thus the 115 feet agl structure now proposed by DCW would not conflict with this surface.

Impacts and Mitigation

(a) *Roadways*

Construction of the Project is not anticipated to have permanent impacts on roadways or traffic within the Route B route width study area. However, the Project will likely result in temporary impacts including road and lane closures and an increase in traffic congestion. Temporary road and lane closures will be necessary to safely and efficiently install the generation tie line across roadways, as necessary. Road and lane closures may cause delays, but most crossings will be able to be completed within 24-48 hours. Once the generation tie line has been installed near a road or lane closure, the road and/or lanes will be re-opened and traffic flow would resume as normal. Most of the roads within the Route B width route study area have minimal daily traffic, and road and/or lane closures should not have significant impacts on local traffic. There may be some traffic impacts at the crossings of U.S. Highway 14 and State Highway 56.

The Project will temporarily increase traffic congestion within the Route B route width study area and surrounding areas. However, due to the rural setting and generally low traffic present within a majority of the Route B route width study area, this temporary increase is not anticipated to have a significant impact on local traffic.

Construction and installation of utility lines within road ROWs will require permits from the appropriate regulatory agencies. Refer to **Section 7.4** for additional information.

(b) *Railroads*

The Applicant will coordinate with DM&E in order to acquire the appropriate crossing permits and to ensure the safety of all construction and railway personnel.

(c) *Airports and Airstrips*

As described for Route A, Capital Air Group identified areas where obstruction surfaces could restrict structures to below 135 feet in height. However, Route B does not cross through the most restrictive areas identified, therefore no impacts to TOB are anticipated as a result of Route B. Following final structure design and siting, DCW will identify and file all structures that require notice to the FAA. Based on DCW internal review, no obstruction issues are expected to result from the FAA aeronautical study.

6.5.11 Electric and Magnetic Fields

The discussion of ELF-EF and ELF-MF in **Section 5.5.11** for Route A applies to Route B.

Impacts and Mitigation

No impacts to human health from ELF-EF or ELF-MF are anticipated. The detailed discussion in **Section 5.5.11** (Impacts and Mitigation) applies to Route B.

6.6 Land-Based Economies

6.6.1 Agriculture

Land use within the Route B route width study area is primarily agricultural and agriculture accounts for approximately 292.68 acres, or approximately 73% of the Route B ROW. According to the 2012 USDA Agricultural Census Report, over 80% of the land in Dodge County (roughly 225,418 acres) was used for agriculture on approximately 621 farms. Corn, soybeans, and wheat are the primary crops grown in Dodge County, while swine and cattle are the predominant livestock raised in the county. The total market value of agricultural products sold in the County for 2012 was approximately $288.1 million, with crop markets totaling approximately $177.6 million and livestock markets totaling approximately $110.5 million (USDA 2014; **Table 45**).

Agricultural land use within Olmsted County is less than Dodge County, at approximately 63% of the County. Roughly 264,407 acres were used for agricultural on approximately 1,150 farms in 2012, according to the USDA Agricultural Census Report. The total market value of agricultural products sold in the County in 2012 was $293.05 million, with crop markets totaling approximately $164.4 million and livestock markets totaling approximately $85.6 million (USDA 2014; **Table 45**).

Table 45: Agriculture Statistics for Dodge and Olmsted and the State

Location	Number of Farms	Average Farm Size (acres)	Land in Farms (acres)	Crop Sales	Livestock Sales
Dodge County	621	363	225,418	177,607,000	110,522,000
Olmsted County	1,150	230	264,407	164,449,000	85,644,000
Minnesota	**74,542**	**349**	**26,035,838**	**$13,879,211,000**	**$7,400,974,000**

Source: USDA 2012 Census of Agriculture County Summary Highlights

Approximately 58.7% of the Route B ROW is classified as prime farmland, while 38.8% is classified as prime farmland if drained. Additionally, approximately 1.8% of land within the ROW is not classified as prime farmland and approximately 0.6% is considered farmland of statewide importance. **Table 46** summarizes the impacts to prime farmland for the Route B ROW and **Map 3 (Prime Farmland Map)** in **Appendix H (Environmental Feature Maps)** details farmland classifications along Route B.

Impacts and Mitigation

The Project is not expected to significantly impact agricultural land use or the general character of the area. The current design includes 281 pole structures within the Route B ROW. Each structure is anticipated to result in approximately 29 feet^2-113 feet^2 of impact (6 feet-12 feet diameter), resulting in an estimated 0.408 acre of total permanent impact from pole installation along the Route B ROW. Of these structures, approximately 187 are planned in land used as cultivated crops (approximately 0.271 acre of total impact). While a small amount of land per generation tie line structure will be taken out of agricultural production for each structure, landowners may continue to plant crops and graze livestock near the generation tie line structures. Final generation tie line structure siting will include discussions with landowners to keep the footprint of each structure to a minimum and to identify agricultural infrastructure (*e.g.*, drain tiles) that should be avoided, or will need to be disturbed and subsequently repaired, on their property.

The use of feedlots is a common practice in raising livestock in the state of Minnesota. The MPCA administers rules regulating livestock feedlots in Minnesota. According to MPCA's What's In My Neighborhood, there are 602 registered feedlots in Dodge County and 710 registered feedlots in Olmsted County (MPCA 2018). A total of 16 of the aforementioned registered feedlots are located within the Route B route width study area. There are two registered feedlots within the Route B ROW; one is located in Dodge County and one is located in Olmsted County. Livestock in pastureland may be temporarily disrupted during construction but appropriate measures will be made to ensure fenced pastureland is secure. Temporary fencing may be put in place if fencing is impacted and will be repaired or replaced after construction.

Land that is used for agricultural production will largely remain unchanged. Short and long-term effects on agricultural land will be minimal. Crops will be able to be planted up to generation tie line structures. Changes in agricultural equipment maneuvering routes around transmission structures will be required in some areas, but should have a nominal effect on overall production. When construction occurs outside of winter months there is a higher possibility that minor temporary impacts could occur. Soil compaction, loss of planting opportunity, crop damage, and drain tile damage could occur due to construction throughout the entire 401-acre ROW. However, it is unlikely that impacts occur to the entire ROW as temporary impacts will likely be limited to access areas, laydown areas, and stockpiling areas. Impacts that do occur are anticipated to be minor. The only farmland that will remain permanently altered will be land where generation tie line structures are erected and positioned.

After construction of the generation tie line structures is completed, all remaining land surrounding the structures and can still be farmed. This negligible loss of agricultural land will not result in the loss of agricultural-related jobs or net loss of income.

The Applicant will coordinate with landowners to identify property features, such as terraces and drain tiles that need to be avoided during construction activities. Should incidental soil compaction occur as a result of temporary construction activities, appropriate measures will be taken to ensure farmland is restored in accordance with the lease agreement between the landowner and the Applicant. Refer to **Table 46**, below, for estimated impacts to land based economies.

Table 46: Impacts of Route B on Land Based Economies

Route B Impacts	Total
Cropland in ROW (acres)	292.68
ROW Percent Cropland	73.05%
Route Length (miles)	26.31
Route B route width study area (acres)	7,099.58
ROW (total acres)	400.65
Total Number of Poles	281
Estimated Permanent Impacts from Pole Installation (acres)	0.408
Prime Farmland	
Prime Farmland within ROW (acres)	235.32
Percent of ROW that Crosses Prime Farmland	58.74%
Number of Poles in Prime Farmland	174
Estimated Impacts from Pole Installation to Prime Farmland (acres)	0.255
Prime Farmland if Drained within ROW (acres)	155.58
Percent of ROW that Crosses Prime Farmland if Drained	38.83%
Number of Poles in Prime Farmland if Drained	106
Estimated Impacts from Pole Installation to Prime Farmland (acres)	0.152
Farmland of State Importance within ROW (acres)	2.31
Percent of ROW that Crosses Farmland of State Importance	0.58%

Route B Impacts	Total
Number of Poles in Farmland of State Importance	0
Estimated Impacts from Pole Installation to Farmland of State Importance (acres)	0.000
ROW Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance (acres)	393.21
ROW Percent Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance	98.14%
Total Number of Poles in Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance, and Prime Farmland if Protected from Flooding	280
Total Estimated Pole Impacts to Prime Farmland, Prime Farmland if Drained, Farmland of Statewide Importance, and Prime Farmland if Protected from Flooding (acres)	0.407
Forestry	
Commercial Forestry Operations in Route	0
Commercial Forestry Operations in ROW	0
Tourism	
Water Trails Crossed by ROW	0
Number of Snowmobile Trails in ROW	2
Number of Snowmobile Trail Crossings by ROW	2
Mining	
Mines within Route	0
Mines within ROW	0

6.6.2 Forestry

There are no economically important forestry resources within the Route B route width study area (refer to **Table 46**). Most wooded areas within the Route B route width study area consist

of shelterbelts or small woodlands surrounding active farmsteads or bordering streambanks. See **Map 1 (National Land Cover Database Map)** in **Appendix H (Environmental Feature Maps)** for details related to wooded areas along Route B.

Impacts and Mitigation

No impacts to economically important forestry resources are expected to occur; therefore, no mitigation will be necessary. If applicable, the Applicant will restore wooded areas in accordance with the lease agreement between the landowner and the Applicant.

6.6.3 Tourism

Dodge County offers tourism and recreational opportunities throughout the year. In 2016, annual leisure and hospitality expenditure in Dodge County was approximately $12,284,994, which equated to about 426 private tourism-related jobs in the County (Explore Minnesota 2018). Generally, tourism in Dodge County focuses on promoting the area's parks, art, and hospitality facilities, as well as recreational activities. Local community events include the Dodge Center Harvest Fest, Mantorville Marigold Days, Zumbro Bend Rendezvous, Dodge County Relay for Life, Claremont Hog Fest, Festival in the Park, Dodge County Free Fair, and West Concord Survival Days.

Annual leisure and hospitality expenditure in Olmsted County in 2016 totaled approximately $487,499,455, which equated to about 8,725 private tourism-related jobs in the county (Explore Minnesota 2018). Rochester offers such tourism draws as the Rochester Art Center Reptile and Oxbow Park, Zollman Zoo and the Heritage House Victorian Museum, in addition to outdoor recreational activities.

As discussed in **Section 6.1**, there are no WMAs, WPAs, SNAs, or WRP conservation easements within the Route B ROW or Route B route width study area. There is one WMA (Bud Jensen WMA) within one mile of the Route B route width study area. These public resources provide recreational and tourism opportunities including biking, camping, wildlife watching, hunting, fishing, and snowmobiling (MNDNR 2012). As discussed in **Section 6.5.8** and included in **Table 46**, there are two snowmobile trails that bisect the Route B ROW (refer to **Map 4 (Public Land Ownership and Recreation Map)** in **Appendix H (Environmental Feature Maps)**).

Impacts and Mitigation

Generation tie line structures are expected to be located mostly on private lands, and, therefore, there will be relatively few direct impacts, if any, to existing recreational facilities and tourism activities. The Applicant has initiated coordination with the snowmobile clubs and will continue to coordinate with the clubs regarding the placement of pole structures in the vicinity of the trails and construction timing. Impacts to snowmobile trails will be mostly visual in nature. The

Generation tie line structures are not anticipated to have a negative effect on area tourism. Since no negative impacts to tourism are anticipated, no mitigation will be necessary.

6.6.4 Mining

Based on review of MN/DOT County Pit Maps and MN/DOT ASIS data, there are no economically significant mining resources within the Route B route width study area (MN/DOT 2002, 2018; **Table 46**). According to current aerial imagery and the 7.5 Minute Series USGS topographic map for Hayfield, Minnesota (USGS 1966), a minor sand or gravel operation appears to occur within the Route B route width study area southwest of the intersection of 240th Avenue and 670th Street in Dodge County. This sand or gravel pit is located outside of the Route B ROW. Quarries, gravel, and sand pits exist throughout Dodge and Olmsted counties but are largely inactive, abandoned, or their use is limited to a private landowner.

Impacts and Mitigation

Project infrastructure will not be located within sand or gravel operations and the Project is not expected to impact the mining industry. As such, no mitigation will be necessary.

6.7 Archaeological and Historical Resources

The Project Area is located in the Southeast Riverine Archaeological Region. The Southwest Riverine Archaeological Region covers the southwestern most corner of Minnesota, including all of Dodge County and all of Olmsted County (Hudak et al. 2002). Archaeological resources are predominantly concentrated near wooded areas and along major river terrace systems; specifically, archeological resources would be expected near water sources on terraces, bluffs, and hilltops. However, archaeological resources have been documented in a large variety of landforms within the region.

The SHPO and Minnesota OSA were visited in May 2017, in February 2018, and again in March 2018 to gather cultural resources records related to the Route B route width study area. Cultural resources data maintained by the SHPO and OSA include NRHP records, MSHSN records, MSM records, MSRHP records, "state site" or "state archaeological site" records, records related to previous professional architectural and archaeological surveys, and records related to reported architectural inventory resources and archaeological sites.

Cultural resources listed on the NRHP, MSHSN, MSM, and MSRHP are not located within the Route B route width study area. The Route B route width study area also does not contain previously recorded archaeological sites. The Route B route width study area contains three known architectural inventory resources (**Table 47**). The Route B alignment would not cross over Bridge 89099 (Site Number: DO-CAN-011), but would cross over U.S. Highway 14 (Site Numbers: XX-ROD-016 and OL-ROD-001) and State Highway 56 (Site Number XX-ROD-022). These three architectural inventory resources have not been evaluated for listing on the

NRHP. Refer to **Map 5 (Cultural Resources Map)** in **Appendix H (Environmental Feature Maps)**.

Table 47: Architectural Inventory Resources Within the Route B Route Width Study Area

Site Number	Site Name / Site Type	Site Significance
DO-CAN-011	Bridge 89099 / Bridge	Unevaluated
XX-ROD-016 and OL-ROD-001	U.S. Highway 14 – Byron to Rochester / Highway	Unevaluated
XX-ROD-022	State Highway 56	Unevaluated

Impacts and Mitigation

While DCW implements an avoidance strategy for cultural resources, the proposed construction activities for the Project may have the potential to encounter unidentified archaeological sites. Should impacts to cultural resources that appear eligible for listing on the NRHP be unavoidable, DCW will consult with the SHPO and/or OSA on whether or not the resource is eligible for listing on the NRHP. In addition, should DCW encounter unidentified archaeological sites during Project construction DCW will follow a UADP to address any unanticipated discoveries of cultural resources, including archaeological sites and possible human remains. Further information concerning the UADP is discussed below.

Three architectural inventory resources are located within the Route B route width study area. The Route B alignment would not cross over bridge 89099, but would cross over U.S. Highway 14 and State Highway 56. Examination of aerial imagery indicates these highways are currently traversed by existing distribution/transmission line routes. Therefore, indirect (*i.e.*, visual) impacts to these highways would not increase from the current impacts created by existing distribution/transmission line routes within the vicinity of Route B. Therefore, direct and/or visual impacts are not anticipated to affect these architectural inventory resources.

Previously recorded archaeological resources are not located within the Route B route width study area. Therefore, impacts to previously recorded archaeological resources would not occur as a result of construction of the Route B alignment. A Phase I archaeological survey will be conducted within high probability areas of Route B prior to construction to identify and avoid unrecorded archaeological sites which may be present.

DCW will avoid impacts to any discovered significant archaeological or architectural resources to the extent practicable during all phases of the Project, including development micrositing, construction, and operation. Utilization of existing transmission line corridors reduces impacts to cultural resources compared to construction of new transmission line. Attempts were made to design the Route B alignment to utilize existing transmission line and utility corridors to the extent possible. If significant archaeological resources are identified during the Phase I

archaeological surveys, the integrity and significance of the resource(s) will be assessed in terms of the potential for NRHP eligibility. If the identified archeological resource(s) are determined to be significant and cannot be avoided by the Project, further investigation and/or mitigation of the resource may be needed and will be coordinated with the SHPO and/or OSA. While avoidance of archaeological resources would be the preferred option, mitigation of impacts to NRHP-eligible archaeological resources may be necessary. The results of this additional investigation or mitigation will be described and documented on a case-by-case basis by compilation into a report, or reports, and shared with the SHPO, and/or the OSA.

While there are no state regulations which require an UADP, DCW will prepare such a plan. Should Project construction and/or operation inadvertently encounter previously undocumented archaeological resources or human remains, the discoveries will be reported to the SHPO and/or OSA, as applicable. Should human remains be inadvertently discovered the UADP will address Minnesota's *Damages; Illegal Molestation of Human Remains; Burials; Cemeteries; Penalty; Authentication Statute* (MS 307.08), which protects known or suspected human burials and burial grounds regardless of land ownership status.

6.8 Natural Environment

6.8.1 Air Quality

The air quality within the Route B route width study area will be the consistent with the Route A route width study area, as they are located in close proximity to each other. Refer to **Section 5.8.1** for information related to air quality.

Impacts and Mitigation

The construction and operation of the Project is not anticipated to result in significant permanent or temporary impacts to air quality. Refer to **Section 5.8.1** for information regarding potential temporary and permanent impacts resulting from the Project.

6.8.2 Water Quality

The CWA mandates that each state publish a list of impaired waters (waterbodies that do not meet water quality standards due to excessive pollution) every two years under Section 303(d) of the CWA. In Minnesota, the MPCA has jurisdiction over determining 303(d) waters and publishes this bi-annual list, known as the 303(d) list. The majority of impairments to surface waters in the Route B route width study area are caused by agricultural sources (fecal coliform, dissolved oxygen, turbidity, excess nutrients/eutrophication). There are two listed impaired waters crossed by the Route B alignment (**Table 48**; see **Map 6 (Surface Water Map)** in **Appendix H (Environmental Feature Maps)**). Cascade Creek is listed as impaired due to turbidity. Salem Creek is listed as impaired due to fecal coliform (MPCA 2016).

Table 48: Impaired Waters Crossed by Route B

Waterbody Name	Cause of Impairment
Cascade Creek	Turbidity
Salem Creek	Fecal Coliform

Source: (MPCA 2016)

In addition to the above Section 303 jurisdictional authority, the MPCA has jurisdiction of Section 401 of the CWA. Section 401 requires that projects which discharge into jurisdictional waters obtain a WQC in compliance with state and federal water quality regulations.

Finally, the State of Minnesota designates specific surface waters as trout streams or lakes, according to Minn. Stat. Section 6264.0050. No designated trout streams or lakes are within the Route B route width study area or are crossed by the Route B alignment.

Impacts and Mitigation

Construction activities associated with the construction of the proposed Route B alignment have the potential to temporarily impact water quality along the Route B ROW. Surface waters, including streams and ditches crossed by the Route B alignment, are narrow and normal spacing of the permanent transmission structures are expected to fully span all surface water features and will be outside the banks of these surface waters. Mitigation measures will be implemented to prevent sedimentation; however, temporary, minor water quality impacts may occur during the construction of the proposed Project. The main potential construction-related impact to water quality is from the disturbed soils which have the potential to enter waters during storm events or snowmelt. Byproducts of this potential runoff include increased turbidity and localized sedimentation of the stream. These types of sedimentation events would result in a temporary alteration of the water quality and can be minimized with the incorporation of a SWPPP and other BMPs (*e.g.*, silt fence, straw waddles, soil erosion control matting, etc.). Agriculture is likely to have the greatest impact on water quality in the vicinity of the Project. The potential for a limited, temporary increase in the sediment load in the water caused by construction activities would be minor in comparison with the agricultural activities and runoff that already occur regularly in the Route B route width study area.

To the greatest extent practicable, mitigation measures would be incorporated to minimize surface water impacts during the construction of this Project. The Applicant will apply for an NPDES Permit from the MPCA, including the development of a SWPPP identifying BMPs to be incorporated during construction to minimize erosion and sedimentation. Additionally, any equipment maintenance, fueling of vehicles, or storage of chemicals should be away from any

surface waters to protect against impacts to surface waters. Spills should be controlled and cleaned up immediately to eliminate the potential for the material to enter surface waters.

6.8.3 Primary Water Resources

The Route B route width study area is part of the Lower Mississippi River Watershed (USEPA 2018a). The Route B alignment passes through one sub-watershed of the Lower Mississippi River Watershed: the Zumbro Watershed (USEPA 2018b). The Lower Mississippi River and Zumbro River watershed areas are part of the Upper Mississippi – Region 7 water resource region, as defined by the USGS. **Table 49** contains the 8-digit HUC USGS identifier for the Zumbro Watershed.

Table 49: Watersheds (8-digit HUC) Crossed by Route B

Watershed Name	HUC (8-digit)	Crossing Length (miles)
Zumbro	7040004	26.31

Seven primary surface water features cross the Route B alignment: Cascade Creek, Salem Creek, the North Fork of Salem Creek, and four un-named creeks. Cascade Creek, Salem Creek, the North Fork of Salem Creek, and one un-named tributary of Salem Creek are crossed in the eastern part of the Route B alignment. The other three un-named creeks are crossed in the western portion of the Route B alignment. No large lakes are located in the Route B route width study area. Refer to **Map 6 (Surface Water Map)** in **Appendix H (Environmental Feature Maps)**.

Impacts and Mitigation

Impacts to primary water resources and any applicable mitigation for the Route B alignment are discussed in the sections below.

6.8.4 Groundwater Resources

The State of Minnesota contains six distinct groundwater areas based on information from the MNDNR (2001). The Route B route width study area is located partially within the South-central Province (Province 2) and the Southeastern Province (Province 3) in the southeastern corner of the state. Route B crosses Province 3 along the eastern portion of the route in Olmsted County and eastern Dodge County. Province 3 has thin or no unconsolidated sediments over bedrock, however the bedrock has productive aquifers. The remainder of Route B crosses Province 2. This province has clayey overburden with limited use surficial or buried sand aquifers. The sedimentary bedrock is commonly used for a groundwater supply (MNDNR 2001). The general availability of groundwater from bedrock aquifers is good for both Provinces. The Route B

alignment crosses both Provinces. Refer to **Map 7 (Groundwater Province Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing the groundwater provinces along Route B.

The MDH manages the County Well Index, Source Water, and Wellhead Protection Programs. The County Well Index is a database that contains groundwater well information for over 340,000 wells in Minnesota (MDH 2018). Review of the County Well Index indicates that there are 51 wells located within the Route B route width study area, with depths ranging from 18-361 feet below the surface. Although none of these wells are located within the Route B ROW, one well is approximately 15 feet away from the Route B alignment and approximately 126 feet deep, and one well is located approximately 37 feet from the Route B alignment and does not have a listed depth.

Impacts and Mitigation

Overall, impacts to groundwater resources are not anticipated since continuous need for groundwater use will not be required and intrusion into groundwater systems is not projected to occur. Major impacts to groundwater resources and wells are not expected from the construction and operation of Route B due to abidance of setbacks and the minimal water-related needs. O&M water requirements will be fulfilled with either well or rural water service.

Wells in the Route B route width study area typically range from 18 feet to 361 feet deep. No wells are located within the Route B ROW. One well is located approximately 15 feet from the Route B alignment and is 126 feet below the surface, which is significantly deeper than the maximum structure foundation depth, which is generally anticipated not to exceed approximately 40 feet. Another well is located approximately 36 feet away from the Route B alignment, does not have a designated depth, and will not be impacted. Well locations will be taken into account and generation tie line structures will be set back following state and county standards as needed. Construction and operation of Route B is not expected to impact groundwater resources; therefore, no mitigation is proposed.

6.8.5 Wetlands

The majority of wetland features within the Route B route width study area are associated with watercourses (which are discussed further in **Section 6.8.6**). The USFWS NWI data mapping indicates that many of these wetlands associated with watercourses are categorized as emergent, shrub/scrub, or forested wetlands (see **Map 8 (National Wetlands Inventory Update for Minnesota Map)** in **Appendix H (Environmental Feature Maps)**). In addition, some NWI mapped wetlands within the Route B route width study area are present in cultivated fields and may be actively farmed. Based on aerial photograph interpretation, a moderate number of these watercourses and associated wetlands are also likely jurisdictional WOUS due to their apparent connectivity with the Mississippi River, a TNW.

According to the USFWS NWI database (USFWS 2018), the Route B route width study area contains approximately 68 mapped NWI wetlands which equates to approximately 121.66 acres. Wetland types and their associated acreages are illustrated in **Table 50** (USFWS 2018). The Route B ROW contains 22 wetlands totaling approximately 11.64 acres (**Table 51**), 14 of which are crossed by the Route B alignment.

Table 50: NWI Wetlands Crossed by Route B Route Width Study Area

NWI Wetland Type	Number of Wetlands in Route Width	Acreage of Wetlands in Route Width
Palustrine Emergent (PEM)	45	94.69
Palustrine Forested (PFO)	10	15.32
Palustrine Scrub/Shrub (PSS)	8	9.27
Palustrine Unconsolidated Bottom (PUB)	4	2.23
Freshwater Pond (PAB)	1	0.16
Riverine Waters	0	0
Total	**68**	**121.66**

Table 51: NWI Wetlands Crossed by Route B ROW

NWI Wetland Type	Number of Wetlands in ROW	Acreage of Wetlands in ROW
Palustrine Emergent (PEM)	14	10.55
Palustrine Forested (PFO)	4	0.52
Scrub/Shrub (PSS)	2	0.36
Palustrine Unconsolidated Bottom (PUB)	2	0.21
Freshwater Pond (PAB)	0	0
Riverine Waters	0	0
Total	**22**	**11.64**

Calcareous fens are not found within the Route B route width study area. The closest mapped calcareous fen is located approximately 4.8 miles north of the Route B route width study area. Calcareous fens are rare and distinctive wetlands characterized by non-acidic peat with a constant supply of calcium and magnesium bicarbonate rich groundwater. This specialized environment is dominated by a calcium-loving plant community. Due to the specialized nature of fens, it is unlikely to find fen habitat within the Route B route width study area (MNDNR 2017).

Impacts and Mitigation

Routing of Route B included identifying and avoiding potential jurisdictional wetland and non-wetland areas to the extent feasible. Wetland resources will be field-verified and officially delineated prior to construction. Project structures will be sited so as to avoid or minimize adverse impacts to the extent feasible. Overall, impacts to wetlands should generally be minor. A grid network of county and township roads currently exist within the Route B route width study area that will offer considerable access to the Route B ROW, further reducing the potential for wetland impacts.

Potential impacts to emergent wetlands and forested/scrub-shrub wetlands are likely to occur from the development of Route B. There are 14 emergent wetlands, four forested wetlands, and two scrub-shrub wetlands within the Route B ROW, totaling approximately 11.64 acres (**Table 51**). Of this acreage, approximately 0.88 acres are forested and scrub-shrub. Permanent impacts may consist of pole installation within a wetland feature or wetland conversion (*i.e.*, tree trimming and woody vegetation removal) of shrub-scrub or forested wetlands within the ROW for the O&M of the generation tie line. Conversion of scrub-shrub and forested wetlands may affect the health of the respective wetland systems and the functions that these wetlands perform. Temporary impacts to wetlands may consist of temporary matting to allow construction crews to access the Route B ROW and temporary incidental sedimentation from construction runoff. **Table 52** includes a summary of more detailed data pertaining to wetland impacts.

Table 52: Impacts of Route B on Wetlands

Route B Potential Impacts	Total
ROW Acres	400.65
Total Wetlands within the ROW (acres)	11.64
Number of Wetlands Crossed by Route B Alignment	14
Number of Wetlands within Route B ROW	22
Number of Wetlands within Route B Route Width Study Area	68
Percent of the ROW that Crosses Wetlands	2.91%

Route B Potential Impacts	Total
Forested Wetlands in ROW (acres)	0.52
Scrub-Shrub Wetlands in ROW (acres)	0.36
Emergent Wetlands in ROW (acres)	10.55
Number of Forested Wetlands in ROW	4
Number of Scrub-Shrub Wetlands in ROW	2
Number of Emergent Wetlands in ROW	14
Percent of the ROW that Crosses Forested Wetlands	0.13%
Percent of the ROW that Crosses Scrub-Shrub Wetlands	0.09%
Percent of the ROW that Crosses Emergent Wetlands	2.63%

Currently, the Route B preliminary design includes four pole structures within NWI mapped emergent wetlands resulting in approximately 0.006 acre of total impact. These locations will be field verified to determine if the wetland feature exists within the landscape as NWI mapping is considered preliminary. If wetlands exist at proposed pole locations, DCW will attempt to move the pole structure out of the wetland features. If the structure cannot be moved, DCW will follow all federal, state, and local regulations related to wetland impacts. Additionally, there are approximately 0.36 acres of scrub-shrub wetland and 0.52 acres of forested wetland within the Route B ROW, totaling 0.88 acres of woody wetland vegetation. As such, 0.88 acres may be impacted through wetland conversion for the development and maintenance of the Project. This acreage represents the worst case scenario and actual conversion is anticipated to be less.

In the State of Minnesota, agencies representing three levels of government (federal, state, and local) regulate certain activities that affect wetlands, lakes, and watercourses. Wetlands are federally protected under Section 404 of the CWA. A wetland permit from the USACE is required when discharging dredged or fill material into jurisdictional wetland and/or non-wetland WOUS. A permit and/or PCN may also be required by the local watershed district depending upon the location, size, and type of impact. Mitigation by the USACE is required if certain permit thresholds are met.

Any wetland listed in the PWI maps (MNDNR 2018) that may be impacted would require a Public Waters Work Permit. A Public Waters Work Permit must be obtained from the MNDNR for work affecting the course, current, or cross-section of public waters, including public waters wetlands. Moreover, a license from the MNDNR is required to cross PWI waters with an electric transmission line. Most other wetlands not listed in the PWI are regulated under the Minnesota

WCA of 1991. The WCA is administered by the Minnesota Board of Water and Soil Resources and is implemented by LGUs. There are two different LGUs administering the WCA within each county's respective portions of the Route B route width study area. These LGUs are the Dodge County Environmental Services Department and the Olmsted Soil and Water Conservation District. Generally, an LGU Replacement Plan is required by the WCA for an impact that wholly or partially drains or fills a wetland.

During the design phase of Route B, measures will be taken to largely avoid or minimize impacts to wetland areas. Results of the wetland desktop analysis and constraints analysis will be considered by the Applicant in an effort to avoid wetlands to the maximum extent practicable. All wetlands, where possible, will be crossed aerially and transmission pole placement will be sited so as to avoid impacts. If temporary or permanent impacts to wetlands are unavoidable, the impacts will be minimized to the maximum extent practicable. BMPs will be employed to protect topsoil, minimize soil erosion, re-vegetate disturbed areas with non-invasive species, and protect wetland resources from direct and indirect impacts. Wetland soils and moderately to strongly sloped ground can also be subject to sheet and rill erosion or slumping. Depending on site specific needs, seasonal construction scheduling, cutting trees where the stumps remain, temporary timber matting, erosion control blankets, mulch, straw bales, rolls, tackifiers, temporary seeding, hydro-mulch, and sediment fence may be used to manage soil erosion. Where feasible, a narrower construction corridor may be considered to minimize impact.

A SWPPP and NPDES permit will be obtained prior to construction. Significant adverse impacts to wetlands are not anticipated because of conscientious design considerations and the implementation of stormwater BMPs.

Compensatory mitigation may be required if certain impact thresholds are surpassed. Currently, it is the Applicant's understanding that there are three types of compensatory mitigation available: (i) project-specific (permittee-responsible) compensation; (ii) in-lieu fee; and (iii) mitigation banking. Permittee-responsible compensation requires the permittee to provide wetland/aquatic resource restoration, creation, enhancement and/or preservation, either on-site and/or off-site in relation to the permitted impact area. Purchase of wetland mitigation bank credits is the preferred method of compensation by the USACE, MNDNR, and many LGUs.

6.8.6 Lakes, Rivers, Streams, and Ditches

The Route B route width study area is located within the Upper Mississippi River Basin and is found within the Zumbro watershed (HUC8 07040004) (USEPA 2018). Within this drainage basin, numerous intermittent and ephemeral watercourses, and a few perennial watercourses, are scattered across the Route B route width study area.

Section 404 of the CWA and Section 10 of the Rivers and Harbors Act require a permit from the USACE for any discharge of dredged or fill materials into jurisdictional WOUS. No Section 10 waters are located within the Route B route width study area. However, many of the

watercourses crossed by the Route B alignment are likely to be jurisdictional WOUS under Section 404 of the CWA.

Those waters designated by the State of Minnesota as Public Waters (Minn. Stat. § 103G.005, Subdivision 15) are regulated by the MNDNR. These waters comprise the PWI as set forth in Minn. Stat., Section 103G.005, Subdivision 15 (MNDNR 2018a). The MNDNR requires a license to cross PWI waters with an electric transmission line (Minn. Stat. § 84.415). The MNDNR will require a Public Waters Work Permit to alter the course, current, or cross-section of any water listed in the PWI.

According to the USGS NHD dataset, the Route B alignment crosses 26 NHD waters (USGS 2018) (**Table 53**). Six of these streams are MN public watercourses with designated 50-foot buffer requirements according to the MN Buffer Law (MNDNR 2018b). These include the perennial Salem Creek, Salem Creek North Fork, and one tributary to Salem Creek in the east central portion of the Route B alignment; and, three tributaries to Dodge Center Creek in the western portion of the Route B alignment (**Table 54**). Dodge Center Creek is north of the Route B route width study area. In addition, one agricultural watercourse in the central portion of the Route B alignment has a 16.5 foot designated buffer requirement per the MN Buffer Law (MNDNR 2018b). Refer to **Map 6 (Surface Water Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing surface water and PWI features along Route B.

Table 53: Impacts to PWI Waters and Shallow Lakes for Route B

Route B Impacts	Total
Number of NHD Stream and River Crossings by Route B Alignment	26
Number of PWI Stream and River Crossings by Route B Alignment	7
Number of PWI Lakes within Route B Route Width Study Area	0
Number of PWI Lakes within ROW	0
Number of Shallow Lakes within Route B Route Width Study Area	0
Number of Shallow Lakes within one mile of Route B Route Width Study Area	0

PWI-designated watercourses that intersect the Route B alignment are listed below in **Table 54**.

Table 54: Minnesota Designated PWI Streams and Rivers Crossed by the Route B Application Alignment

Waterbody Name	Number of Crossings
Salem Creek, North Fork (M-034-082-004)	1
Unnamed Creek (M-034-082-018)	1
Unnamed Creek (M-034-056-004-021-001-001-003)	1
Unnamed Creek (M-034-056-004-021-002)	1
Salem Creek (M-034-082)	1
Unnamed Creek (M-034-056-004-021-001-001)	2

In addition to the review of watercourse and PWI waters summarized in **Table 53** and **Table 54** above, the Route B route width study area was reviewed for lakes. This review revealed that no PWI lakes are located within the Route B route width study area.

Impacts and Mitigation

Permanent impacts to lakes, rivers, streams, and ditches are not expected to occur from the development of Route B as pole structures are not planned within these features. Temporary impacts may consist of temporary culverts/ crossings below the OHWM to allow for access throughout the Route A ROW and temporary sedimentation from construction runoff. The Applicant will work with the USACE and MNDNR to ensure all proper permits, licenses, and approvals are obtained for surface water crossings by the Route B alignment. The USACE administers permitting for WOUS. Impacts to WOUS may need to be mitigated. The MNDNR has jurisdiction for State Public Waters listed in the PWI. Through the permitting approval process, the Applicant and the MNDNR will determine the appropriate mitigation measures for PWI crossings.

An NPDES permit will be obtained by the Applicant from the MPCA for the construction of the Project. The Applicant will also develop a SWPPP in compliance with all MPCA rules and guidelines. All waterways crossed by the Route B alignment would be maintained for proper drainage. Temporary culverts or other temporary crossing devices would be utilized to maintain proper drainage in accordance with the SWPPP and any permit requirements. If construction within the ROW requires tree removal along waterways, where feasible, trees would be cut so that the root system remains intact, in order to retain bank stability. If necessary, sediment barriers would be placed along waterways and slopes during construction to protect stream banks

from soil erosion and watercourses from sedimentation. Limited permanent impacts to surface water resources are anticipated.

6.8.7 Floodplains

FEMA FIRMs are available for most of the Route B route width study area (only the Olmsted County portions of the Route B route width study area are not mapped by FEMA). Within Dodge County, there are approximately 96 acres of mapped 100-year floodplains (Zone A) for Salem Creek, Salem Creek-North Fork, and associated tributaries within the Route B route width study area (FEMA 2018). Additionally, in Dodge County there are approximately 20 acres of mapped 100-year floodplains (Zone A) associated with Cascade Creek within the Route B route width study area (FEMA 2018). Within the Dodge County portion of the Route B ROW, there are approximately nine acres of mapped 100-year floodplains (Zone A) associated with Salem Creek and its tributaries and approximately three acres of mapped 100-year floodplains (Zone A) associated with Cascade Creek. A large expanse of the Route B route width study area that has agricultural watercourses has been determined as an area with minimal flood hazards (Zone C). The majority of base flood elevations have not been determined for the Route B route width study area. See **Map 6 (Surface Water Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing floodplains along Route B.

Impacts and Mitigation

Extensive planning and analysis efforts were made to site Route B such that floodplain areas were avoided and that where floodplain crossings were necessary, that crossings could be made in locations narrow enough to facilitate pole spanning so as to avoid placement of transmission structures within floodplains, where feasible. The current design includes four pole structures within floodplains, totaling approximately 0.006 acres of total impact. As this is a preliminary layout, DCW may attempt to move structures out of floodplains, if feasible. Should the placement of transmission structures in floodplains be necessary, permitting will be sought and any necessary mitigation will be implemented. Any impacts to floodplains resulting from a limited number of pole placements would be minor and would not impact the function of the floodplain.

6.8.8 Flora

The Route B route width study area spans the following Minnesota ecological regions and subsections (MNDNR 2018a):

- Eastern Broadleaf Forest (Province)
    - *Minnesota and Northeast Iowa Morainal* (Section)
        - Oak Savanna Subsection (222Me)
    - *Paleozoic Plateau* (Section)
        - Rochester Plateau Subsection (222Lf)

The Eastern Broadleaf Forest Province spans approximately 12 million acres of eastern North America. Approximately 84% of the Route B route width study area occurs within the eastern edge of the Oak Savanna Subsection and approximately 16% within the Rochester Plateau Subsection.

The Oak Savanna Subsection (222Me) is a fire prone region historically occupied by relatively expansive bur oak savanna. Oak savanna typically is concentrated at the juxtaposition of prairie and heavily forested landscapes. Overall vegetation structure can be characterized as scattered, mature trees with minimal closed forest canopy and continuous tallgrass prairie and forb understory. The dominant tree species is bur oak. Areas with denser forest canopy (*i.e.*, >30% canopy closure) are a direct result of fire suppression (NatureServe 2017). Wetlands occupy an important role in this ecosystem, particularly from a historical context.

Modern day settlement throughout southeastern Minnesota has converted much of this ecological region to urban centers and cultivated agricultural lands (MNDNR 2018a). No ecological subsection in southern Minnesota is comprised of greater than 5.0% oak savanna (*i.e.*, upland shrubland/woodland; MNDNR 2006a), particularly the region spanned by the Route B route width study area.

Where the eastern border of the Oak Savanna Subsection meets the Rochester Plateau Subsection, additional hardwood forest ecosystems becomes more prevalent and regions of maple-basswood forest can thrive, particularly where topographic features contribute to natural fire suppression. The North-Central Interior Maple-Basswood Forest is comprised primarily of mesic deciduous species, typically with foliage canopy that is quite dense. High canopy closure contributes to a dense mixture of understory growth of shrubs and forb species (NatureServe 2017). Since this forested habitat often is associated with sloped topography and bottoms, these landscape features primarily drive the occurrence of this forest type within vicinity of the Route B alignment.

Similar to the Oak Savanna subsection, the Rochester Plateau has experienced significant conversion of natural vegetation communities to agriculture and urban developments. Approximately 7% of the subsection remains as forest cover and wetland/grassland habitat.

It should be noted here that as the Route B alignment moves from the Oak Savanna east into the Rochester Plateau subsection, the numbers of documented SGCN records (*i.e.*, per township) increases notably (MNDNR 2006a).

Today, the majority of both ecological subsections consists primarily of row crop agriculture (a minimum of at least 69% agricultural coverage; MNDNR 2006b). Similarly, the majority of the Route B alignment spans agricultural row crop. The 2011 National Land Cover Database (Homer et al. 2015) indicates that the Route B route width study area contains approximately 6,363 acres of cultivated land, or about 90% of this study area. The Route B ROW traverses approximately 293 acres of cultivated row crop land cover (*i.e.*, 73%; **Table 38**).

Approximately, 167 acres of non-cultivated vegetation are intersected by the Route B route width study area (*i.e.*, 2%); similarly, 2% *(i.e.*, 7 acres) of the ROW consists of non-cultivated vegetation (**Table 38**). Of this acreage that intersects the ROW, herbaceous/grassland classification represents the majority of natural land cover spanning approximately 6.7 acres, or 1.67%. Approximately 0.1 acres (*i.e.*, 0.03%) of deciduous woodland is indicated as being traversed by the ROW.

A preliminary aerial interpretation of the above natural vegetation areas that intersect the ROW yields deciduous woodland classification to be consistent with treed fence-lines, or narrow forested riparian corridors. In a handful of instances, the ROW follows the border of treed homestead lots. There is no indication that subject woodlots traversed by the Route B ROW are consistent with remnant bur oak savanna or other woodlands that MNDNR would designate as native plant communities that deserve particular conservation focus.

Regarding herbaceous/grassland classification acreage, approximately 6.7 acres intersect the Route B ROW. A preliminary aerial interpretation of this vegetation classification indicates that much of this acreage appears to be associated with drain buffer vegetation and few parcels that appear consistent with grassland restoration. NWI data corroborate that the Route B ROW intersects wetland acreage in each of three wetland classifications: emergent, shrub-scrub, and forested.

USGS GAP (2015) data indicate the following ecosystem classifications that intersect the Route B route width study area and ROW (refer to **Map 9 (GAP Land Cover Map)** in **Appendix H (Environmental Feature Maps)**). Acreages of these native vegetation communities likely represent the highest flora species richness (*e.g.*, NatureServe 2017):

<u>Route B Route Width Study Area</u>

- North-Central Interior Dry-Mesic Oak Forest and Woodland
- Ruderal forest
- Western Great Plains Wooded Draw and Ravine
- North-Central Interior Maple-Basswood Forest
- Central Interior and Appalachian Floodplain Systems
- North-Central Interior and Appalachian Rich Swamp
- Central Tallgrass Prairie
- Central Interior and Appalachian Shrub-Herbaceous Wetland Systems
- Harvested Forest - Grass/Forb Regeneration
- Recently burned shrubland

<u>Route B ROW</u>

- North-Central Interior Dry-Mesic Oak Forest and Woodland
- Western Great Plains Wooded Draw and Ravine
- Central Interior and Appalachian Floodplain Systems

- North-Central Interior and Appalachian Rich Swamp
- Central Interior and Appalachian Shrub-Herbaceous Wetland Systems
- Harvested Forest - Grass/Forb Regeneration

Together, these GAP plant community classifications account for 0.77% of the Route B route width study area acreage and 0.37% of the Route B ROW.

Visual assessment of aerial imagery yields at least nine ROW habitat (*i.e.*, relatively natural vegetation) crossings by the Route B ROW. These habitat crossings likely consist of a fairly diverse group of flora species, yet no part of this landscape appears to be consistent with historic oak savanna dominated land cover as implied by the ecological subsection classification.

Sites of Biodiversity Significance (MNDNR)

The MBS identifies two *Sites of Biodiversity Significance* that are located completely within and/or partly overlap the Route B route width study area (MBS 2017). Each of these Sites of Biodiversity Significance is entirely within Dodge County.

The MBS uses classification ranking system to denote the level of biological diversity characteristics of a particular site. Ranking classifications are based on degree to which the occurrences of the rarest species, including rarest native plant communities or the most intact native ecosystems, are present (MNDNR 2018b). One of the sites within the Route B route width study area is given a biodiversity significance ranking of *below* and one is given a biodiversity significance ranking of *moderate* (**Table 55;** refer to **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**). Sites ranked as *below* lack occurrences of rare species and natural features or do not meet the minimum MBS threshold for biodiversity significance. These sites may include areas of conservation value at the local level, such as habitat for native plants and animals, corridors for animal movement, buffers surrounding higher-quality natural areas, areas with high potential for restoration of native habitat, or open space. Sites ranked as *moderate* contain occurrences of rare species, moderately disturbed native plant communities, and/or landscapes that have strong potential for recovery of native plant communities and characteristic ecological processes. The two sites are as follows:

- Canisteo 9 – 1.64 acres within the Route B route width study area but outside of Route B ROW
- Canisteo 29 – 4.68 acres within the Route B route width study area but outside of Route B ROW

Table 55: Sites of Biodiversity Significance associated with Route B

Site of Biodiversity Significance Ranking	Number of Sites Within Route B Route Width Study Area	Acres	Number of Sites Within Route B ROW	Acres
Below	1	1.64	0	--
Moderate	1	4.68	0	--
High	0	--	0	--
Outstanding	0	--	0	--

Designated Critical Plant Habitats (USFWS)

A broader scale Information Planning and Consultation (USFWS 2018a, b) analysis indicated that two federally threatened flowering plant species have the potential to occur in this region of Minnesota:

- Leedy's Roseroot
- Prairie Bush-Clover

According to USFWS recovery plan information, critical habitat rules for either species have not been designated (USFWS 2018a, b). Furthermore, Leedy's roseroot is an exceedingly rare wildflower that is isolated to cliffside habitats. The Route B ROW does not traverse such topographic features. Prairie bush-clover typically occurs on mesic prairie slopes. USGS GAP data indicated that prairie habitat cover may occur within the Route B route width study area (also, see below section regarding MNDNR designated native prairies).

Please refer to **Section 6.8.10** for a more detailed discussion of rare and threatened and endangered species of the Route B route width study area.

Native Plant Communities & Prairies

MNDNR specifically defines recognizable native plant community units. There are two MNDNR designated native plant communities within the Route B route width study area associated with the Canisteo 29 site. Specifically, 4.37 acres of *Southern Mesic Prairie* (Ups23a) and 0.29 acres of *Southern Wet Prairie* (WPs54b) occur along Salem Creek within the outer edges of the Route B route width study area (refer to **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**). These native plant

communities do not intersect with the Route B ROW. These rich plant communities consist of grass-dominated vegetation with patches of forbs and shrubs over soils ranging from well-drained to somewhat poorly drained (*Southern Mesic Prairie*) and poorly drained to very poorly drained (*Southern Wet Prairie*). Both native prairie communities rely on fire to persist; without fire, woody tree species would begin to dominate and these native plant communities would transform out of prairie type habitat (MNDNR 2018c, d).

Impacts and Mitigation

Construction and subsequent maintenance of the Route B ROW is expected primarily to impact crop cultivation and common vegetation associated with roadside ditches. Minimal other natural vegetation is anticipated to be permanently impacted during establishment of the ROW. Approximately 0.4% of the Route B ROW consists of natural habitats that likely contain the greatest plant species richness (**Table 56**). As such, more than 99% of the ROW will be avoiding impacts to natural flora communities. Additionally, the ROW will not impact recognized areas of high quality biodiversity significance or specifically designated native plant communities.

Table 56: Summary of Estimated Natural Vegetation within Route B ROW

Land Cover (GAP 2011) – Route B ROW		
Ecosystem Category	**Acres**	**Percent of ROW**
North-Central Interior Dry-Mesic Oak Forest and Woodland	0.24	0.06%
Western Great Plains Wooded Draw and Ravine	0.02	0.00%
Central Interior and Appalachian Floodplain Systems	0.31	0.08%
North-Central Interior and Appalachian Rich Swamp	0.09	0.02%
Central Interior and Appalachian Shrub-Herbaceous Wetland Systems	0.54	0.13%
Harvested Forest – Grass/Forb Regeneration	0.28	0.07%
Cultivated Cropland	307.82	76.83%
Pasture/Hay	0.64	0.16%
Developed, Open Space	77.23	19.28%
Developed, Low Intensity	12.40	3.10%
Developed, Medium Intensity	1.08	0.27%

Construction may result in minor impacts to unavoidable drainages or other low profile vegetation features. The Applicant will coordinate with the local NRCS office and MNDNR as appropriate regarding reseeding with locally sourced native seed mixes and any additional BMP. Due to the presence of native prairies within the Route B route study width, the Applicant will develop a prairie management plan for Route B detailing avoidance and BMPs to ensure these native features are not impacted.

The Applicant will implement BMPs in working with all construction parties entering the Route B ROW in order to control and prevent the introduction of invasive species to natural plant communities, as designated by the MDA (MDA 2018a, b). These BMPs include limiting invasive species spread via maintenance equipment and vehicles through early detection of invasive species, cleaning mowers and bladed equipment, minimizing disturbance to native areas, limiting traffic through weed-infested areas, and frequently inspecting equipment storage areas for weeds. In the event that invasive weeds are detected within the Project area, control through properly timing, cutting, and conducting targeted herbicide use consistent with the herbicide BMPs published by the MN/DOT and MDA (MDA 2018c, MN/DOT 2018).

For impacts to cultivated crops and subsequent plan for mitigation, please reference **Section 6.6.1** of this permit application. For impacts to wetlands and subsequent plan for mitigation to those flora communities, please reference **Section 6.8.5** of this permit application.

6.8.9 Fauna

Wildlife typically associated with an agricultural landscape with a matrix of scattered prairie remnants, wetlands, and wooded areas are expected to be prevalent throughout the Route B route width study area. These wildlife species include mammals, various bird taxa, fish, aquatic invertebrates, and terrestrial insects.

Many common mammal species are likely to utilize the Route B route width study area including white-tailed deer, raccoon, coyote, red and gray fox, Virginia opossum, gray squirrel, fox squirrel, thirteen-lined ground squirrel, and striped skunk. The larger mammal species are most likely to utilize the wooded areas and uncultivated grassland areas that are present within the Route B route width study area, while the smaller mammal species are likely to use those areas as well as the cultivated areas within the Route B route width study area.

The Route B route width study area is within the range of several bat species including little brown bat, big brown bat, silver-haired bat, eastern red bat, hoary bat and the federally threatened northern long-eared bat. These bats are fairly common within Minnesota, with the exception of the northern long-eared bat, and, while the range of these bats overlaps the general vicinity of the Route B route width study area, the preferred habitat of these species is not abundant near the Route B route width study area and is largely absent from the Route B ROW.

A wide variety of bird species are known to occur within this region of southeastern Minnesota and are likely to utilize the habitats present within the Route B route width study area. The Minnesota Breeding Bird Atlas (MNBBA; 2017) and Avian Knowledge Network (AKN 2018) data were assessed for other species of conservation concern. The suite of expected species that occurs within the greater Dodge and Olmsted County region is not higher than any other surrounding habitat or counties. Nearly 200 species of birds occur in this area on an annual basis, with over 100 species breeding in the regional vicinity of the Route B route width study area (AKN 2018, National Audubon Society 2018).

Primary protection for migratory bird species that are not federally or state-listed occurs under the MBTA (MBTA 1918). The MBTA provides the primary legal protection for most birds in the United States (MBTA 1918). The MBTA makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, or purchase any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations. The migratory bird species protected by the MBTA are listed in *50 CFR 10.13*.

Several raptor species do nest within the Dodge-Olmsted County region, particularly bald eagle. MNDNR designates some raptor species as being of conservation concern (MNDNR 2016), such as Swainson's hawk (*Buteo swainsoni*), which is known to have a sparse nesting distribution that encompasses the Route B route width study area. Additionally, bald eagle is federally protected through the *Bald and Golden Eagle Protection Act* (BGEPA 1940).

Bald eagle nest surveys were conducted as part of the pre-construction due diligence for this proposed development (Atwell 2017a). Data were collected on all observed nesting raptors, and general results indicate that raptor stick-nest structures occur in relatively low density across this landscape, possibly owing to the general scarcity of habitat. At the time of aerial field surveys, a larger study plan area was surveyed for stick nests, and results yielded one red-tailed hawk known stick nest structure and one great horned owl (*Bubo virginianus*) nest structure in the Route B route width study area, along with a single active bald eagle nest at the edge of this study area boundary. None of these nest structures are located within the Route B ROW. Additional information related to known eagle nest resources in relation to the Route B route width study area are discussed below in **Section 6.8.10.**

Aquatic fauna (both vertebrate and invertebrate) are anticipated to be relatively scarce within the study area, since open water resource does not occur within the Route B route width study area, and watercourse (*i.e.*, streams) crossings are minimal. A total of 26 NHD streams, six of which are PWI streams, (please refer to **Section 6.8.6**) occur along the Route B alignment. Based on aerial review, approximately eight of these streams are perennial, but these are narrow perennial streams that are expected to harbor aquatic animals common to southeastern Minnesota. Data pertaining to SGCN fish species, such as Ozark minnow, appear to be associated with Salem Creek and Salem Creek-North Fork. Salem Creek crosses the ROW at one location (Dodge

County) and Salem Creek-North Fork crosses the ROW at one location (Dodge County), so aquatic animal assemblages that could contain more scarce species, are not anticipated to intersect the Route B alignment in more than a handful of places.

Please refer to **Section 6.2** and **Section 6.8.8** which discuss the different land cover types, available habitat, and natural communities that harbor much of the wildlife diversity that is found along the Route B route width study area.

Impacts and Mitigation

Impacts to wildlife and their associated habitats have the potential to occur during construction and operation of the Route B ROW. The agriculture-dominated habitat matrix currently is highly fragmented, and ROW construction will remove a minimal amount of wildlife habitat but may not contribute to additional habitat fragmentation, which can impose particular adverse impacts to a variety of wildlife.

Permanent impacts to wooded habitats, particularly in association with riverine forested corridors have the potential to impact bat maternity roost trees for any of the various bat species known in the Project vicinity, should they be present. Northern long-eared bat is known to have occurred within Dodge and Olmsted counties (USFWS 2017a). To date, no known northern long-eared bat roost trees are known to exist within the proposed Route B route width study area. For additional discussion about potential impacts to the northern long-eared bat, please refer to **Section 6.8.10**.

For terrestrial wildlife habitats, Route B alignment design will be engineered to avoid placement of tower structures within these habitats, particularly within more sensitive habitats (*e.g.*, streams, wetlands). To the greatest extent practicable, these habitats will be spanned by the line and construction practices will avoid bringing heavy equipment through these habitats to the extent practicable. For avoidance and impact minimization construction practices associated with wetlands, please refer to Section 6.8.5.

Furthermore, the Route B alignment likely will not pose a significant barrier to movement/migration of most terrestrial wildlife species expected to occur in this region. ROW construction will not be spanning any officially designated conservation corridors or other notable wildlife habitat corridors (*e.g.*, Important Bird Areas [National Audubon Society 2018], state WMAs).

Of any animal species that reside or seasonally occur within the Route B route width study area, avian taxa likely will be the single species group that will experience a continual direct hazard from Route B alignment development. Transmission lines have been documented to pose a hazard for birds, through collision mortality and electrocution (Bevanger 1994, Erickson et al. 2005). As such, DCW will design the Project consistent with APLIC guidelines. DCW will continue to coordinate with MNDNR.

Particular attention will be paid to portions of the Route B alignment that cross surface water features which have a higher likelihood of attracting relatively large concentrations of animals (APLIC 2006, 2012). Additionally, APLIC advises on various scenarios when bird flight diverters should be used to prevent collision fatalities (APLIC 2012). MNDNR has requested the use of bird diverters on overhead lines near lakes and rivers, or other areas that may attract large concentrations of waterfowl and the Applicant will coordinate with MNDNR to best implement this request.

Known nest sites within the Route B ROW may be of concern, particularly for raptors, where regular flights to and from nests may intersect line configurations. Several raptor species do nest within the Dodge-Olmsted County region, particularly bald eagle and Swainson's hawk. Currently, the Route B alignment avoids the majority of known and/or active raptor nests within the Route B route width study area (please refer to discussion of local bald eagle nest and possible impacts in **Section 6.8.10**).

6.8.10 Rare and Unique Natural Resources

(a) *Threatened and Endangered Species*

Federally Listed Species

The USFWS provides distribution lists of federally-listed threatened, endangered, and candidate species on a county-by-county basis. These lists were reviewed for Dodge and Olmsted counties. Additionally, the USFWS IPaC (USFWS 2018a) was used to assess which federally listed species occur within the near vicinity to the Route B route width study area. Broad-scale data analysis indicated that three federally threatened species may occur within the Route B ROW (**Table 57**). None of these species have officially designated critical habitat.

Dodge and Olmsted counties are within the range (*i.e.*, has documented records and/or has the potential to harbor critical habitat for the designated species within the scoped county) of the federally threatened northern long-eared bat. This *Myotis* bat utilizes a forested landscape where summer roosting habitat depends on availability of suitable roost tree substrate (USFWS 2015). Preliminary data within Dodge County indicate that northern long-eared bat may be resident within the sparsely forested landscape in near vicinity to the Route B alignment (Normandeau Associates, Inc. 2014). No specific surveys have been conducted specific to the Route B route width study area and a preliminary desktop habitat review indicates that no impacts to northern long-eared bat habitat are anticipated.

As described previously in the **Section 6.8.8**, two federally threatened flowering plant species occur within the region of southeastern Minnesota traversed by the Route B route width study area (USFWS 2018a, b): Leedy's roseroot and prairie bush-clover. These two flowering species occupy notably different habitats.

Prairie bush-clover (also state threatened) is a Midwestern bush clover endemic to healthy tallgrass prairie systems, particularly those maintained through periodic prescribed fire (USFWS 2018c). MNDNR (MNDNR 2018e) indicates that remnant populations in southwestern Minnesota typically occur on dry-mesic prairie slopes with populations concentrated in concave bowls containing gravely soils. Populations in southeastern counties are associated with upper slopes of bluff prairies, which may contribute to increase scarcity in this region of the state. MNDNR presumes that remnant populations in level prairie areas have long since been plowed under and remain exceedingly rare if not extirpated. The Route B route width study includes 4.33 acres of Southern Mesic Prairie and 0.28 acres of Southern Wet Prairie that occur in a level prairie setting which may contain suitable habitat for this species.

Leedy's roseroot (also listed as state endangered) is an exceedingly rare plant in the United States and occurs in widely spaced populations in South Dakota, Minnesota, and New York (USFWS 2018d). In southeastern Minnesota, this rare flowering plant is known from a handful of isolated populations tied to maderate cliffs in the drainages of the Root River and Whitewater River (MNDNR 2005, USFWS 2018d). The Route B route width study area does not appear to traverse cliffside karst formations that fit the habitat profile to harbor this threatened species.

The bald eagle is federally protected through the *Bald and Golden Eagle Protection Act* (BGEPA 1940) and the National Bald Eagle Management Guidelines (NBEMG; USFWS 2007) guides development projects that may have impacts on nesting eagle pairs and nest sites. Atwell (2017a) located one active nest at the boundary of the Route B route width study area (Dodge County; Canisteo Township). The nest is located approximately 1,200 feet east of the Route B alignment and 1,125 feet east of the Route B ROW. The NBEMG specifies a 660-foot construction activities avoidance buffer for any known eagle nests during a specifically designated breeding season. Direct impacts to the nest tree are not anticipated given its distance from the Route B ROW.

MNDNR Listed Species

The Applicant requested a formal NHIS data summary of rare species and other significant natural resource features review from MNDNR NHIS (July 19, 2017; Correspondence # ERDB 20170420) for a broad study area encompassing the Route B route width study area. This database represents the single most up-to-date repository of records for rare or significant species occurrences. On August 16, 2017, the MNDNR replied with a data assessment and general review. The MNDNR assessment further incorporated data from a 1-mile buffer around this review area, which yielded records for a total of 18 species. These species represent a variety of terrestrial and aquatic species, including seven vascular plant species. Three of these species possess watchlist status and are tracked by MNDNR but do not have specific legal protections within the state.

One Ozark minnow (species of concern) record from 1986 occurs within the Route B route width study area and intersects with the Route B ROW (See **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**). This record consists of 14 fish and is associated with the crossing of Salem Creek. The Ozark minnow prefers small to medium clear perennial streams with minimal impacts from pollution and siltation. Ozark minnows can typically be found within slow moving water adjacent to riffles (MNDNR 2018f).

Additionally, two historic breeding records for the loggerhead shrike (state endangered) from 1996 occur within the Route B route width study area, one of which crosses into the Route B ROW (See **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**). This medium sized songbird typically utilizes open habitats with scattered trees and shrubs, particularly pasture where barbed wire fencing is present (Eliason 1996). This region of southeastern Minnesota coincides with a large segment of the state's remnant population (Eliason 1996, Pfannmuller et al. 2017, AKN 2018). During June 2017, a site visit (Atwell 2017b) confirmed the presence of nesting shrikes in Dodge County (Canisteo Township), approximately 0.4 miles south of the Route B route width study area boundary (See **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**). This observation is significant because the record occurred in an area predominated by row crop cultivation, which is the dominant land cover type throughout the Route B ROW and surrounding study area. Thus, there are points along the Route B ROW that can be interpreted via desktop review of aerial photographs as potentially suitable shrike nesting habitat.

Table 57: State- and Federally-Listed Species in Dodge & Olmsted Counties, Minnesota that are within Route B Route Width Study Area

Common Name	Scientific Name	Record within Route B ROW	Status	
			State	Federal
Prairie Bush-Clover	*Lespedeza leptostachya*	No	Threatened	Threatened
Northern Long-eared Bat	*Myotis septentrionalis*	No	Special Concern	Threatened
Leedy's Roseroot	*Rhodiola integrifolia* ssp. *leedyi*	No	Threatened	Threatened
Loggerhead Shrike	*Lanius ludovicianus*	Yes	Endangered	--
Ozark Minnow	*Notropis nubilus*	Yes	Special Concern	--

The Route B route width study area encompasses two MNDNR designated ecological/zoological assemblages of concern (*i.e.*, MNDNR designated Native Plant Communities) (**Table 58**; see **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**).

Table 58: Ecological and Animal Assemblages: Dodge & Olmsted Counties, Minnesota within the Route B Route Width Study Area

Name	Type of Assemblage	Acreage in Route B Route Width Study Area	Acreage in Route B ROW
Southern Mesic Prairie	Ecological	4.33	--
Southern Wet Prairie	Ecological	0.28	--

Impacts and Mitigation

As indicated in **Section 6.8.8**, the Route B alignment and Route B ROW span a landscape that intersects few biodiverse habitat assemblages. Based on land cover data and an exhaustive review of NHIS data, the probability that the ROW will intersect and subsequently impact federally threatened, or endangered species is relatively low, particularly for the listed flowering plants noted above.

Impacts to northern long-eared bats are not anticipated. No known northern long-eared bat roost trees are known to exist within the ROW. The USFWS has published tree clearing recommendations to mitigate for direct impact to this species (USFWS 2015). Should the Applicant identify or receive information indicating a roost tree is near or within the Route B route width study area, no tree clearing would occur within 150 feet of a known roost between June 1 and July 31 in keeping with the USFWS 4(d) rule for this species within the white nose syndrome zone, which includes all of Minnesota (USFWS 2018e).

The Route B ROW is a greater distance away from the single, known active bald eagle nest in the vicinity of the Route B route width study area than the established 660-foot construction avoidance area (please refer to USFWS 2007). Additionally, APLIC guidance will be utilized to determine suitable line marking procedures to prevent avian collision.

Strictly aquatic species, specifically the ozark minnow, are not likely to be impacted by the construction and operation of Route B. Direct impacts to aquatic features will not occur from the construction of the Project as all support structures will be located outside of the OHWM and the associated 50 foot setback from MN public water courses, as required (see **Section 5.8.6**).

Indirect impacts from erosion and sedimentation will be mitigated through the implementation of BMPs as described in **Section 5.8.6**.

Since state endangered loggerhead shrikes nest in low height profile vegetation communities, remnant suitable habitat may be present and MNDNR will be consulted for existing BMPs in the event that territorial and/or nesting birds are discovered occupying the ROW at the time of construction.

Finally, the Route B ROW avoids existing native plant communities delineated by MNDNR. Thus, impacts will not occur to MNDNR designated native plant communities.

(b) *Natural Resource Sites*

As indicated previously in **Section 6.8.8**, MBS identifies two *Sites of Biodiversity Significance* that are located completely within and/or partly overlap the Route B route width study area (Dodge County only; MNDNR 2014; see **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**). Neither of these sites overlap the Route B ROW.

Table 59: MCBS Sites Crossed by Route B

Site Name	Crossed by Application Route B ROW	Crossed by Route B Route Width Study Area	Existing Powerlines Present	Biodiversity Significance Rating
Canisteo 9	No	Yes	No	Below
Canisteo 29	No	Yes	No	Moderate

Table 60: Summary of Environmental Sites for Route B

Environmental Site Type	Total
Number of MBS Biodiversity Sites Crossed by Route Alignment	0
Number of MBS Biodiversity Sites Crossed by Route Width Study Area	2
Number of WMAs in Route Width Study Area	0
Number of WMAs within 1 mile of Route Width Study Area	1
Number of WMAs within ROW	0

Environmental Site Type	Total
Length (ft) of WMAs over 1,000 ft that are Within ROW	0
Number of SNAs within 1-mile of Route Width Study Area	0
Number of State Parks within 1-mile of Route Width Study Area	0
USFWS Easements within 1-mile Route Width Study Area*	1
Federal-listed Species Observations within Route Width Study Area	0
State-listed Species Observations within Route Width Study Area**	2
State-listed Species Observations within ROW**	1
State-listed Species Observations within Alignment**	1
State-listed Species Observations within 1 mile of Route Width Study Area**	6
Total Unique Species Observed within 1 mile of Route Width Study Area**	4

**Farm Service Agency Interest of Minnesota*

***Only species listed as Endangered or Threatened are included*

Impacts and Mitigation

The majority of sensitive natural resources were avoided during Route B ROW planning. The Applicant will coordinate closely with MNDNR and USFWS, as appropriate, to develop BMP measures to minimize or mitigate impacts to sensitive resources.

Overall, no adverse impacts to rare or unique resources, such as direct take or disturbance, are anticipated through construction of the Project. Through the vast majority of the ROW, existing vegetation types would remain the same following Project construction.

Some disturbance to wildlife likely will occur during construction. The Applicant will coordinate with applicable agencies for guidance on appropriate avoidance and/or mitigation steps.

7.0 ENVIRONMENTAL INFORMATION: SUBSTATION

7.1 Substation

The Applicant proposes to construct a new substation called the Project collector substation, located in Dodge County approximately four miles east of the Dodge-Steele County line and approximately seven miles southwest of the city of Dodge Center. The Project will also require improvements to the existing Byron Substation located immediately west of the City of Byron (refer to **Appendix B (County-Level Maps)**). However, the required improvements will occur entirely within the existing fence line and graveled footprint. Therefore, the environmental analysis detailed in this section is primarily for the new Project collector substation as this will create a new feature type in the landscape and require land use conversion.

7.1.1 Environmental Setting

The Project collector substation is located in western Dodge County, Section 15 of Ripley Township on a privately owned parcel of land that is currently used for crop production. The Project collector substation is encompassed within the Eastern Iowa and Minnesota Drift Plains Level IV ecoregion of the Western Corn Belt Plains Level III ecoregion. The Western Corn Belt Plains land form is level to rolling glaciated till plains, with hilly loess covered plains in the West, with an annual average precipitation of 24 to 36 inches (Auch 2016). The majority of this area is now heavily farmed. Minnesota has classified 39 distinct agroecoregions based on a specific combination of soil type, landscape, climatic features and land use. Agroecoregions are landscape units with relatively uniform crop productivity, climate, geologic parent material, and soil drainage and slope characteristics.

The Project collector substation is within the Level Plains agroecoregion (University of Minnesota and MDA 1998). The Level Plains agroecoregion is comprised of fine-textured, poorly drained soils with row crop production on relatively flat topography. The 2011 National Land Cover Database – Land Use-Land Cover dataset (Homer et al. 2015) indicates that the dominant land use-land cover type within and surrounding the Project collector substation site is cultivated crops.

The dominant soil series associated with the Project collector substation include Readlyn silt loam, Tripoli silty clay loam, and Marquis silt loam. These soils are considered to be silty loams, are classified as Prime Farmland, and are used for agricultural purposes.

The proposed Project collector substation is located in the Zumbro River 8-digit Hydrologic Unit Code subbasin (07040004). The nearest named perennial stream is Dodge Center Creek which lies approximately 2.3 miles to the west. There are several unnamed streams identified on the NHD immediately to the north and southwest of the proposed Project collector substation.

According to the MNDNR's NHIS geographical data, no federally or state listed threatened or endangered species have been recorded within one mile of the proposed Project collector substation. Based on the USFWS NWI map data, no wetlands occur on the proposed Project collector substation site. The nearest wetland, identified as a palustrine emergent wetland, is located approximately 200 feet south of the proposed Project collector substation site.

7.1.2 Land Cover

The land cover within the region surrounding the Project collector substation and Byron Substation are described in **Section 5.2**. The Project collector substation site is located entirely on cultivated crop land cover according to the 2011 National Landcover Database – Land Use-Land Cover Dataset (Homer et al. 2015; see **Map 1 (National Land Cover Database Map)** in **Appendix H (Environmental Feature Maps)**).

7.1.3 Human Setting

a. Public Health and Safety

Emergency management response services and other public health and safety information for the Project collector substation are described in **Section 5.1**.

b. Commercial, Industrial, and Residential Land Use, Displacement

The human settlement information specific to Dodge County discussed in **Section 5.5** would generally be applicable to the proposed Project collector substation site.

The local area is rural agricultural with scattered houses and associated structures. There are two residences approximately 1,800 feet from the substation and 11 accessory structures (*i.e.*, barns, garages, silos or sheds) located within 0.5 miles of the proposed Project collector substation (see **Table 61** and **Appendix C (Detailed Aerial Maps)**).

Table 61: Structures Located within 0.5 Miles of the Project Collector Substation

Structure	Approximate Proximity to Substation
Shed	1,662 feet
Barn/Garage	1,678 feet
Barn/Garage	1,766 feet
Residence	1,803 feet
Residence	1,815 feet

Structure	Approximate Proximity to Substation
Silo	1,909 feet
Shed	1,912 feet
Shed	1,926 feet
Silo	1,928 feet
Silo	1,935 feet
Silo	1,942 feet
Silo	1,946 feet
Silo	1,957 feet

c. Substation Sound

The primary source of sound at the Project collector substation will be from the transformer. One 225 megavolt-ampere (MVA) transformer is proposed for the substation. According to the specification sheet, the sound pressure level for this unit will be 75 dBA. Octave band sound power levels have been estimated using the broadband sound pressure level and techniques in the Electric Power Plant Environmental Noise Guide, Table 4.5 Sound Power Levels of Transformers (Bolt, Beranek and Newman Inc. 1984).

Table 62 summarizes the sound power level data used in the modeling.

Table 62: Summary of Sound Power Level Data Used in Modeling.

Maximum Rating	Broadband	Sound Power Levels per Octave-Band Center Frequency [Hz]								
		31.5	63	125	250	500	1k	2k	4k	8k
225 MVA	95 dBA	92 dBA	98 dBA	100 dBA	95 dBA	95 dBA	89 dBA	84 dBA	79 dBA	72 dBA

The sound impacts associated with the proposed Project collector substation transformer were predicted using the Cadna/A sound calculation software developed by DataKustik GmbH. This software uses the ISO 9613-2 international standard for sound propagation (International Organization for Standardization (ISO) 1996). The benefits of this software are a more refined

set of computations due to the inclusion of topography, ground attenuation, multiple building reflections, drop-off with distance, and atmospheric absorption. The Cadna/A software allows for octave band calculation of sound from multiple sources as well as computation of diffraction. Several modeling assumptions inherent in the ISO 9613-2 calculation methodology, or selected as conditional inputs, were implemented in the Cadna/A model to ensure conservative results (*i.e.*, higher sound levels), and are described below:

- As per ISO 9613-2, the model assumed favorable conditions for sound propagation, corresponding to a moderate, well-developed ground-based temperature inversion, as might occur on a calm, clear night or equivalently downwind propagation.

- Meteorological conditions assumed in the model (temperature=10°C & relative humidity=70%) were selected to minimize atmospheric attenuation in the 500 Hz and 1 kHz octave bands where the human ear is most sensitive.

- No additional attenuation due to tree shielding, air turbulence, or wind shadow effects was considered in the model.

Based on the sound level modeling result, the Project collector substation is predicted to be in compliance with the MPCA noise standards. The closest sensitive receptor is approximately 1,800 feet from the proposed transformer at the Project collector substation. The L_{eq} sound level modeled at this receptor is 28 dBA. The MPCA has established sound level limits found in Minnesota Administrative Rule 7030. The applicable nighttime limits for a Noise Classification Area 1 location are 50 dBA (L_{50}) and 55 dBA (L_{10}). Since the operation of a substation transformer will result in a generally steady and continuous sound, the modeled L_{eq} sound level will be equivalent to the L_{50} and L_{10} sound levels.

Additionally, sound created from the Byron substation improvements will be associated with the two new 345 kV breakers. However, several 345 kV breakers already exist within the Byron substation as well as other noise generating infrastructure. As such, any noise generated from the new 345 kV breakers is expected to be consistent with the surrounding environment and is not anticipated to significantly increase the noise generated by the Byron substation.

d. Aesthetics

The Project collector substation will consist of a newly constructed substation with a graveled footprint anticipated to be up to one acre in size. The substation will include 345 kV busses, transformers, circuit breakers, reactive equipment, steel structures, a control building, metering units, air break disconnect switches, and a fence surrounding the graveled footprint. The new fence to be constructed will likely include galvanized steel chain-link fence fabric seven feet in height with one foot of angled barbed wire on top (comprised of three strands). The Project collector substation will consist of infrastructure at various heights depending on final design.

The Project collector substation will also include an outdoor lighting system. Lighting will be controlled by switches and will only be turned on when personnel are present.

Improvements to the Byron Substation will include the installation of an additional transmission bay, two high-voltage circuit breakers, and a capacitor voltage transformer for metering. All of these improvements will occur within an existing substation and will not create a new feature type within the landscape.

Aesthetic quality and appeal of a region generally derive from the terrain, natural features (*e.g.*, lakes, rivers, ponds, etc.), native flora, and cultural features that define the landscape. Individual observers will have differing opinions on the aesthetic appeal of a region and impacts that may alter the quality. Those likely to be viewing the proposed Project include permanent observers (residents) and temporary observers (motorists, tourists, or recreationalists passing by or using the area intermittently). Residents near the Project collector substation are expected to have a higher sensitivity to the potential aesthetic impacts than temporary observers as they will look at the substation more frequently than those individuals periodically passing through the area.

The Project collector substation general vicinity currently includes farmsteads, OHE transmission and distribution lines, a railroad, and wind turbines. In addition, highways and county roads are an existing part of the man-made alterations to the environment.

e. Socioeconomic

The Project collector substation is located in Ripley Township. Socioeconomic data was gathered for this township and is described in **Section 5.5.6**. Construction of the Project collector substation and the Byron Substation improvements will not create any new full time positions. However, construction is anticipated to require 10-12 temporary jobs. Most, if not all, of these temporary construction personnel will likely be from outside of the region and only remain in Dodge and Olmsted counties over the duration of the Project (approximately 5-7 months).

f. Cultural Values

The cultural values associated with the Project collector substation are likely related to the agriculturally dominated landscape. These cultural values are described further in **Section 5.5.7**.

g. Recreation

Recreational opportunities in the vicinity of the Project collector substation are described in **Section 5.5.8** and depicted on **Map 4 (Public Land Ownership and Recreation Map)** in **Appendix H (Environmental Feature Maps)**.

h. Public Services

Emergency services, water and wastewater services, schools districts, electric utilities, and other public services and facilities are located in the vicinity of the Project collector substation. These public services and infrastructure are discussed in more detail in **Section 5.5.9**.

i. Transportation

The Project collector substation will be located in a privately owned agricultural field accessed by 140th Avenue in Dodge County. A new access road will be constructed and permitted through the Dodge County Engineering Office. The Byron Substation will be accessed from the existing driveway off of 4th Street Northwest in Olmsted County. Additional details regarding transportation in the regional vicinity of the substation is described in **Section 5.5.10**.

7.1.4 Land-Based Economies

The entire site is currently in agricultural production. The development of the Project collector substation is anticipated to permanently remove up to acre of land from crop production. Dependent on landowner preference, the remainder of the site may be leased back to the farmer to be used for agricultural purposes. If the landowner does not wish to use the remainder of the site, the entire site will be purchased.

7.1.5 Archaeological and Historical Resources

Cultural resource records available at the SHPO and the OSA were reviewed in February 2017, May 2017, and February 2018 to identify known cultural resources located within three miles of the Project collector substation. There are currently 10 Historic Properties (sites, structures, properties or districts) listed on the NRHP in Dodge County (National Park Service 2017). All of these NRHP Historic Properties have full location information provided for their listings and are not located within one mile of the Project collector substation. Cultural resources listed on the NRHP, MSHSN, and Minnesota MSRHP also are not located within one mile of the Project collector substation. The nearest archaeological resource is located approximately 2.5 miles south of the Project collector substation and the nearest architectural resource is located approximately 1.1 miles southwest of the Project collector substation. Refer to **Map 5 (Cultural Resources Map)** in **Appendix H (Environmental Feature Maps)**.

7.1.6 Natural Environment

Based on aerial photointerpretation, no intermittent or perennial streams (including PWI waters and 303(d)-listed waters), navigable waters, trout streams, PWI and non-PWI lakes, state-protected calcareous fens, or NWI and PWI wetlands are located on the Project collector substation site. Additionally, the Project collector substation site does not lie within a 100-year floodplain. Refer to see **Map 6 (Surface Water Map)** and **Map 8 (National Wetlands**

Inventory Update for Minnesota Map) in **Appendix H (Environmental Feature Maps)** for details regarding these features.

The Project collector substation is located in the South-Central Province 2 groundwater area and the Byron Substation is located in Southeastern Province 3. Information regarding Minnesota's groundwater areas was previously presented in **Section 5.8.6** and included on **Map 7 (Groundwater Province Map)** in **Appendix H (Environmental Feature Maps)**. According to the Minnesota Department of Health, Minnesota Well Index map viewer (MDH 2017) there are no wells on or immediately adjacent to the Project collector substation site or Byron Substation.

a. Flora

The flora specific to Dodge County discussed in **Section 5.8.8** would generally be applicable to the proposed Project collector substation site.

The proposed Project collector substation is encompassed within the Oak Savannah subsection of the Eastern Broadleaf Forest Province. Historically, the dominant vegetative communities within this Subsection were tallgrass prairie and bur oak savanna; however, the majority of this area is now heavily farmed.

The 2011 National Land Cover Database – Land Use-Land Cover dataset (Homer et al. 2015) and aerial interpretation indicates that the dominant land use-land cover type within the proposed Project collector substation site is cultivated crops. Refer to **Map 1 (National Land Cover Database Map)** in **Appendix H (Environmental Feature Maps)** for a map detailing land cover for the Project collector substation.

b. Fauna

The fauna specific to Dodge County discussed in **Section 5.8.9** would generally be applicable to the proposed Project collector substation site. Wildlife typically associated with an agricultural landscape is expected to be prevalent within and immediately adjacent to the Project collector substation site. The site is not located in or adjacent to any USFWS or MNDNR-protected lands, WPAs, or WMA lands. See **Map 4 (Public Land Ownership and Recreation Map)** in **Appendix H (Environmental Feature Maps).**

7.1.7 Rare and Unique Natural Features

The rare and unique natural features specific to Dodge County discussed in Section 5.8.10 would generally be applicable to the Project collector substation site. According to the MNDNR's NHIS geographical data, no federally or state listed threatened or endangered species have been recorded within one mile of the proposed Project collector substation. In addition, no known raptor nests are within one mile of the substation (Atwell 2017). Refer to **Map 10 (Rare and Unique Natural Features Map**) in **Appendix H (Environmental Feature Maps)**.

7.1.8 Impacts and Mitigation

Overall, impacts to the environmental setting, human settlement, and natural resources are not anticipated since these will remain largely unaffected by the construction and operation of the proposed Project collector substation and the Byron Substation improvements.

Up to one acre of land that is currently used from crop cultivation will be removed from agricultural production for the construction and operation of the Project collector substation. Additionally, no impacts to agricultural activity or land use will occur from the Byron Substation improvements as all work will be conducted within the existing fence line and graveled footprint. The Project is not anticipated to result in a significant impact to agricultural activities within the region.

From an aesthetics perspective, those likely to be most impacted by the collector substation are nearby residents, motorists, and recreationalists using the general area. The substation will alter the visual appearance by adding additional vertical and horizontal man-made structures to the existing landscape. The Applicant sited the Project in coordination with the landowner. Additionally, aesthetic impacts associated with the Byron Substation improvements as these improvements will occur within an existing substation and will not create a new feature type within the landscape.

Based on the sound level modeling result, the Project collector substation is predicted to be in compliance with the MPCA noise standards. Additionally, sound created from the Byron substation improvements will be consistent with existing environment as several 345 kV breakers already exist within the Byron substation. To alleviate any increased sound levels at the Project collector substation and Byron Substation during construction, the Applicant will adhere to the following sound control practices which are recommended to minimize construction sound levels and comply with Minnesota standards:

- Limit heavy equipment activity adjacent to residences or other sensitive receptors to the shortest possible period required to complete the work activity;
- Minimize construction equipment idling;
- Ensure that proper mufflers, intake silencers, and other sound reduction equipment are in place and in good working condition;
- Maintain construction equipment according to manufacturer's recommendations;
- Use portable sound barriers to enclose noisier stationary equipment; and
- Where practical, locate stationary equipment such as compressors, generators, and welding machines away from sensitive receptors or behind barriers; and
- When possible, limit construction activities to day light hours.

Impacts to known archaeological and historical resources would not occur as a result of construction of the Project collector substation. Pedestrian archaeological survey may be initiated on a discretionary basis, or if requested by the SHPO, for the Project collector

substation to identify any unrecorded archaeological sites which may be present and delineate avoidance areas. If cultural resources are discovered during pre-construction archaeological surveys or during construction, appropriate responses would be coordinated with the SHPO. Additionally, the Minnesota State Archaeologist will be notified if unmarked burials, human remains, or grave goods are discovered before or during construction; per Minn. Stat. Section 307.08. Upon discovery of unmarked burials, human remains, or grave goods, Project related activities will cease in the immediate area of the discovery until adequate documentation and/or mitigation measures can be developed between the Applicant and the State Archaeologist.

BMP will be employed during the construction of the substation to minimize impacts to the natural environment, such as:

- The Applicant will apply for a permit, including the development of a SWPPP identifying BMPs to be incorporated during construction to minimize erosion and sedimentation (straw wattles, silt fencing, erosion control blanket, etc.);
- Any equipment maintenance, fueling of vehicles, or storage of chemicals should be away from any surface waters to protect against impacts to surface waters. Spills will be controlled and cleaned up immediately to eliminate the potential for the material to enter surface waters.
- Using mechanical sweepers on paved surfaces, where necessary, to prevent dirt buildup;
- Minimizing idling of construction vehicles;
- Ensuring that construction equipment is properly tuned and maintained prior to and during on-site operation; and
- Use of secondary containment for hazardous material storage.

Other mitigation measures are not anticipated to be necessary for the Project collector substation and Byron Substation improvements as impacts to natural and cultural resources are not anticipated.

8.0 AGENCY INVOLVEMENT, PUBLIC PARTICIPATION AND REQUIRED PERMITS AND APPROVALS

This section describes outreach efforts conducted by the Applicant and discusses pre-application involvement by federal, state, and local agencies. Given that the Applicant does not possess the authority to use eminent domain, DCW has also met with numerous landowners on and around the proposed routes seeking voluntary easements in support of the Project.

8.1 Agency Contacts

DCW initiated its outreach efforts well in advance of this Application, engaging with public agencies through in person meetings and project notification letters. Many agencies, stakeholders, landowners, and other interested parties were contacted in order to gather feedback on the Project (*see* **Tables 63** and **64**). This engagement campaign included meetings with MNDNR, the Minnesota Historical Society, USFWS, and various townships and county commissioners. In these contacts, DCW also requested input from governmental agencies with respect to the resources under their jurisdiction as well as the identification of federal and state permits and approvals that may be required for the Project. Formal correspondence with agencies regarding the Project is presented in **Appendix K (Agency Correspondence)**.

Table 63: Public Agency Inquiry Letter Contact List

Agencies	Location
MN Department Of Natural Resources	New Ulm, MN/ St. Paul, MN
MN Historical Society	St. Paul, MN
United States Fish And Wildlife Service	Bloomington, MN

Table 64: Pre-Application Meetings with LGUs and Local Interest Groups

LGU or Local Interest Group	Location
Canisteo Township	Kasson, MN
Dodge County Engineering	Dodge Center, MN
Township Cooperative Partnership Association	Rochester, MN
City of Byron	Byron, MN

LGU or Local Interest Group	Location
City of Dodge Center/City Council	Dodge Center, MN
Ashland Township	Dodge Center, MN
Dodge County Commission	Mantorville, MN
City of Kasson	Kasson, MN
Claremont Township	Claremont, MN
City of Claremont	Claremont, MN
Kalmar Township	Byron, MN
Ripley Township	Claremont, MN
Hayfield Township	Hayfield, MN

Meetings held with the entities represented in **Tables 63 and 64** are described in the sections that follow.

8.2 Federal Agency Contacts

8.2.1 U.S. Fish and Wildlife Service

DCW contacted the USFWS Twin Cities Ecological Services Field Office by letter on May 5, 2014. In this correspondence, DCW introduced the Project to the USFWS, providing a summary of proposed wildlife studies and MNDNR NHIS data. The USFWS was also provided Project-related GIS data. DCW also met with the USFWS on May 7, 2014 to further discuss Project parameters and survey protocols.

In 2016, the Project was resumed after a period of inactivity, and the Applicant contacted the USFWS via a letter on February 17, 2017 in order to reintroduce the Project and to request eagle nest data. In March 2017, the USFWS provided eagle nest data to the Applicant. On April 13, 2017, the Applicant held an in-person meeting with the USFWS to provide further updates and discuss the Project.

8.2.2 U.S. Army Corps of Engineers

The Applicant held an in-person meeting with USACE, St. Paul District on August 7, 2017 to provide an overview of the Project and discuss related permitting.

8.3 Minnesota State Agency and LGU Contacts

8.3.1 Minnesota Department of Natural Resources

DCW contacted MNDNR by letter on May 5, 2014. In this correspondence, DCW introduced the Project to MNDNR, providing a summary of proposed wildlife studies and MNDNR NHIS data. MNDNR was also provided Project-related GIS data.

The Applicant contacted the MNDNR on January 30, 2017 to reintroduce the Project and to resume coordination. Since this time, the Applicant has been in continued coordination with MDNR. On February 3, 2017, a NHIS data request was submitted to solicit data for the area of the Project and on April 19, 2017, a revised NHIS data request was submitted. On August 17, 2017, the Applicant received the NHIS Review Letter from MNDNR.

On April 13, 2017, the Applicant held an in-person meeting with MNDNR to provide further updates regarding the Project related to wildlife, ecology, and protected areas. On August 7, 2017, the Applicant held an in-person meeting with an MNDNR hydrologist to discuss wetland and water considerations.

In early 2018, the generation tie line routes shifted in various locations. Therefore, on February 27, 2018, the Applicant submitted the new routes for MNDNR's review. On March 15, 2018, MNDNR provided brief preliminary comments through e-mail regarding the proposed routes.

8.3.2 Minnesota Department of Transportation

Coordination with MN/DOT is underway regarding permitting and siting requirements, specifically related to U.S. Highway 14 and State Highway 56. A coordination meeting with MN/DOT to discuss the Project in detail was conducted on May 14, 2018. DCW presented preliminary generation tie line routes for the Project, including those proposed for paralleling or crossing MN/DOT infrastructure. During the meeting, MN/DOT engineering staff provided general information related to the MN/DOT Accommodation Policy, as well as information related to their right-of-way mapping feature and planned future projects in District 6. Additionally, MN/DOT also stated that as part of the PUC process, they would not approve their ROW permit prior to the Commission issuance of a Route Permit. In addition to the required Utility Accommodation Permit, DCW will require a separate crossing permit to cross U.S. Highway 14 near the Project interconnect to Byron Substation. DCW and MN/DOT agreed to continue consultation on the Project as additional engineering details become available. Additional information regarding consultation with MN/DOT on the utilization of road ROW for the Project can be found in **Section 3.2**.

8.3.3 Minnesota State Historic Preservation Office

DCW sent a letter to the SHPO on April 4, 2017, which provided an introduction to the Project. On May 1, 2017, the SHPO provided a letter regarding a Cultural Resources Phase I study conducted for the DCW Resource Area. Correspondence regarding the Project is continuing.

8.3.4 Wetland Conservation Act Local Government Units

The Applicant held an in-person meeting with Dodge County Environmental Services and the Olmsted County Soil and Water Conservation District on August 7, 2017 to provide an overview of the Project and discuss permitting associated with the Project.

8.4 County Contacts

8.4.1 Dodge County

The Applicant initially met with Dodge County Planning and Zoning on September 23, 2016. In that meeting, Project representatives introduced themselves, presented a project overview, and gave an explanation of the state regulated permitting process for the construction of wind farms and transmission lines. At the meeting, Project representatives answered questions from county staff. Also, on September 8, 2017, Project representatives inquired with Dodge County Planning and Zoning regarding: (i) priority generation tie line pole placements; (ii) the Dodge County Floodplain Overlay District; and (iii) permitting considerations. DCW also provided updated MNDNR GIS data. In addition, on April 3, 2018, Project representatives met with Dodge County Planning and Zoning to provide preliminary project maps for a compliance review of local zoning requirements. A secondary zoning review occurred on April 27, 2018.

Project representatives also provided project scope and status updates to the Dodge County Commission through presentations given on February 21, 2017, June 13, 2017, and March 27, 2018. In these updates, Project representatives engaged with and answered questions from Dodge County Commissioners.

Project representatives held discussions with Dodge County Public Works and Dodge County Planning and Zoning on February 21, 2017 regarding: (i) the use of county roads; (ii) the potential to place Project facilities in the county road ROW; and (iii) permitting requirements. Project representatives and consultants held further discussions on June 7, 2017 with Dodge County Public Works regarding the use of county roads, road ROW, and the development of a Project Roads Use Agreement. Representatives of Dodge County have expressed a concern that DCW must be a public utility, like Northern States Power, to use their ROW. DCW has explained to the Dodge County representatives that DCW is not required by law to be a public utility in order to be authorized to place the Project in county ROW, but, rather must obtain a Route Permit from the Commission.

8.4.2 Olmsted County

Project representatives informed the Olmsted County Planning Department about the Project on February 21, 2017. County Planning Staff offered that Project representatives should contact the Olmsted County Township Cooperative Partnership Association and Olmsted County Public Works. Project representatives met with Olmsted County Public Works on February 21, 2017. That meeting included a project overview and discussion regarding the state regulated permitting and application process, the Project's economic benefits, estimated timelines, and use and maintenance of township roads.

8.5 City and Township Contacts

8.5.1 Byron

Project representatives met with the City of Byron on June 12, 2017. The meeting included a project overview and status update, as well as an explanation of the state regulated permitting and application process for Project and its estimated timeline. The City of Byron provided feedback on planned future expansion and a description of city territorial jurisdiction. The City of Byron's concerns included the Project's proximity to residential areas and possible impediments to future development and expansion.

Project representatives contacted the City of Byron again on July 29, 2017 regarding clarification of setback requirements within the city's Industrial Zoned district, specifically the Byron Industrial Park.

Continued contact between city officials and Project representatives has continued to progress. Both parties have sought to explore options for enabling current and future development opportunities while working directly with landowners in proximity of the Byron Substation who are interested in participating in the Project.

8.5.2 Dodge Center

Project representatives met with the City of Dodge Center on November 23, 2016. The meeting included a project overview and status update, as well as an explanation of the state regulated permitting and application process for construction of the Project and its estimated timeline. The city provided feedback on planned future expansion and the city's territorial jurisdiction, and raised considerations and concerns regarding TOB. City officials provided DCW with guidance documents pertaining to future planned expansion, an airport zoning map, and associated proximity regulations pertaining to project development.

Project representatives met with the Dodge Center City Council on June 12, 2017. The meeting included a formal Project presentation, as well as a discussion of the state regulated permitting and application process for construction of the Project and its estimated timeline. Dodge Center

City Council members asked general questions about the economic benefits of a commercial scale wind farm.

8.5.3 Ashland Township

Project representatives met with the Ashland Township Board on June, 12, 2017. The meeting included a project overview and status update, as well as an explanation of the state regulated permitting and application process for construction of the Project and its estimated timeline. The use and maintenance of township roads was also discussed. In addition, Project representatives answered questions from the board.

Project representatives met again with Ashland Township Board on October 9, 2017 to discuss segments of Route A and Route B within Ashland Township's jurisdictional road authority. Discussion points included the use of road ROW, the timeline associated with developing a road use agreement, and Project permitting.

8.5.4 Cannisteo Township

Project representatives met with the Cannisteo Township Board on June 6, 2017. The meeting included a project overview and status update, as well as an explanation of the state regulated permitting and application process for construction of the Project and its estimated timeline. Project representatives answered questions from the Board regarding wind technology, the proposed Route A and B alignments, and the use and maintenance of township roads.

A board member from Cannisteo Township Board attended the October 9, 2017 meeting of the Ashland Township Board and participated in a discussion regarding township road authority, use of ROW to construct the Project, and the use and maintenance of township roads.

8.5.5 Hayfield Township

Project representatives met with the Hayfield Township Board on February 10, 2018. The meeting included a project overview and status update, as well as an explanation of the state regulated permitting and application process for construction of the Project and its estimated timeline. The use and maintenance of township roads was also discussed. Project representatives answered questions from the Board.

8.5.6 Kasson

Project representatives met with the City of Kasson on June 13, 2017. The meeting included a project overview and status update, as well as an explanation of the state regulated permitting and application process for construction of the Project and its estimated timeline. The City of Kasson also provided feedback on future plans and a desire to be notified as information related to the Project evolves.

8.5.7 Mantorville Township

Project representatives informed Mantorville Township Board members about the Project on March 16, 2017 during the Association of County Townships Monthly Meeting. The meeting included a project overview and status update, as well as an explanation of the state regulated permitting and application process for construction of the Project and its estimated timeline. The use and maintenance of township roads was also discussed. Additionally, Project representatives answered questions from the Board. Although the proposed Route A and Route B alignments are not situated in Mantorville Township, officials continue to receive status updates through Project-related mailings.

8.5.8 Salem Township

Project representatives have informed Salem Township of the Project through project-related mailings. Meetings and discussions about potential impacts and permitting requirements have occurred through discussions held on February 21, 2017 with the Olmsted County Township Cooperative Planning Association. Also, on June 7, 2017, the Applicant provided the Township Planning Cooperative Association with a project overview, as well as an explanation of the state regulated permitting and application process, the economic benefits of the Project and its estimated timeline, and the use and maintenance of township roads.

8.5.9 Kalmar Township

Project representatives met with and informed Kalmar Township Board members about the Project on June 19, 2017. The meeting included a project overview and status update, as well as an explanation of the state regulated permitting and application process for construction of the Project and its estimated timeline. The use and maintenance of township roads was also discussed. Additionally, Project representatives answered questions from the Board.

8.5.10 Ripley Township

Project representatives informed Ripley Township Board members about the Project on July 06, 2017. The meeting included a project overview and status update, as well as an explanation of the state regulated permitting and application process for construction of the Project and its estimated timeline. The use and maintenance of township roads was also discussed. Additionally, Project representatives answered questions from the Board.

8.5.11 Township Cooperative Partnership Association, Olmsted County

Project representatives informed Olmsted County Township Cooperative Partnership Association members about the project on February 21, 2017 and June 7, 2017. The meeting included a project overview and status update, as well as an explanation of the state regulated permitting and application process for construction of the Project and its estimated timeline. The use and

maintenance of township roads was also discussed. Additionally, Project representatives answered questions from members of the association.

8.6 Identification of Landowners

DCW has conducted extensive title searches to identify all persons and entities that have recorded interests in the real estate affected by the Project. As part of this effort, a title company was engaged to complete public records searches on necessary parcels. DCW then produced a title report for each parcel to document the parcel's legal description and the owners of record, and to report information regarding easements, liens, restrictions, encumbrances and other conditions of record.

To ensure that the correct landowners were identified, a ROW agent contacted landowners or the landowners' representatives. Therefore, through this process DCW has been in contact with identified landowners who are potentially affected by the Project. DCW remains committed to working with the landowners to address concerns they may have regarding the Project. A list of identified landowners is included with this Application as **Appendix L (List of Landowners)**.

8.7 Required Permits and Approvals

The Project will be constructed within Dodge and Olmsted counties, Minnesota. DCW will be required to obtain a number of federal, state, and local permits prior to initiating Project construction activities. A list of permits and other approvals that may be required for the Project is presented in **Table 65**.

Table 65: List of Potential Permits and Approvals

Regulatory Authority	Permit/Approval
FEDERAL	
Federal Aviation Administration	• Form 7460-1 Notice of Proposed Construction or Alteration (Determination of No Hazard) • Form 7460-2 Notice of Actual Construction or Alteration
U.S. Army Corps of Engineers	• Clean Water Act § 404 Permit • Wetland Delineation Approvals • Rivers and Harbors Act Section 10 Permit

Regulatory Authority	Permit/Approval
U.S. Fish and Wildlife Service	• Informal consultation under Section 7 of the Endangered Species Act • Special Use Permit • Incidental Take Permit • Eagle Non-Purposeful Take Permit
Environmental Protection Agency (region 5) (EPA) in coordination with the Minnesota Pollution Control Agency (MPCA)	• Spill Prevention Control and Countermeasure (SPCC) Plan
STATE	
Minnesota Public Utilities Commission	• Route Permit for high-voltage transmission line • Certificate of Need for high-voltage transmission line
Minnesota Department of Agriculture	• Agriculture Impact Mitigation Plan
Minnesota Pollution Control Agency	• National Pollutant Discharge Elimination System/State Disposal System Permit (NPDES/SDS) – General Storm Water Permit for Construction Activity • SPCC Plan • Clean Water Act Section 401 Water Quality Certification
Minnesota Department of Natural Resources	• General Permit for Water Appropriations, Dewatering • License to Cross Public Lands and Waters • Endangered Species Statutes – Permits and Coordination
Minnesota Department of Transportation	• Oversize/Overweight Permit for State Highways • Access Driveway Permits for MN/DOT Roads • Tall Structure Permit • Utility Access Permit
LOCAL	

Regulatory Authority	Permit/Approval
Dodge County/Olmsted County	• Zoning Permits • Building Permits • Interim Use Permits • Roadway Access Permits • Drainage Permits • Working in ROW Permits • Overweight/Over-Dimension Permits • Utility Permits • Wetland Conservation Act Approval
Townships	ROW permits, crossing permits, road access permits, and driveway permits for access roads and electrical collection system, as needed

8.7.1 Federal Permits

USACE, Section 404, Clean Water Act, Permit

A Section 404 permit is required from the USACE under the CWA for discharges of dredged or fill material into waters of the United States. DCW will apply for these permits once a Route Permit is issued for the Project.

The Project would not require replacement wetlands under Minnesota law because it would be covered under the Federal Approvals exemption for utilities. In accordance with Minn. Stat. Section 103G.2241, subd. 3 and 6 and Minn. R. 8420.0420, subp.4, a replacement plan is not required for wetland impacts resulting from the construction, maintenance, or repair of utility lines, when such a project is authorized by the USACE under Section 404 of the CWA. The Applicants will submit a Notice of Exemption to all LGUs after a Route Permit is issued, concurrent with the submittal of the USACE application.

USACE, Section 10, Rivers and Harbors Act, Permit

The USACE regulates impacts to navigable waters of the United States under Section 10 of the River and Harbors Act. The Applicants will apply for a permit for any required crossings once a Route Permit is issued for the Project.

FAA, Part 7460 Review

FAA notice and approval are required for structures 200 feet above ground level or those that may exceed an imaginary surface extending outward and upward at certain slopes defined in the

Code of Federal Regulations Chapter 77.9. Form 7460-1 will be submitted to the FAA for notice of construction. Each individual structure meeting these requirements will be registered for notice, which would include information such as the latitude and longitude, structure height, and the elevation at the structure location. The FAA then conducts an aeronautical study for potential airspace impacts and issues a determination of hazard or no hazard. If a structure location is changed prior to construction, it is necessary to resubmit Form 7460-1 for that structure. When the construction is complete, as-built information will be submitted using Form 7460-2.

USFWS, Incidental or Non-Purposeful Take Permit

The Endangered Species Act of 1973, as amended, (ESA) directs the USFWS to identify and protect endangered and threatened species and their critical habitat. Section 9 of the ESA prohibits a taking of federally-listed species, which is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." The term "harm" includes significant habitat alteration which kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Projects involving federal lands, funding or authorizations require consultation between the lead federal agency (*i.e.*, the USACE) and the USFWS, pursuant to Section 7 of the ESA. If it is determined a project will have adverse impacts on a listed species, a Biological Opinion and Incidental Take Statement will be issued by the USFWS.

Spill Prevention, Control and Countermeasure Plan

A SPCC plan is required to contain and prevent discharge of oil or other petroleum products into waters of the United States. Should the minimum volume threshold be met for construction (*e.g.*, fuel storage) and substation operation for the Project, the Applicants will develop the necessary SPCC plans.

8.7.2 State of Minnesota Permits

MPCA, NPDES Permit

The MPCA requires an NPDES Permit for stormwater discharges associated with construction activities disturbing one acre of land or greater. Prior to construction, DCW will obtain a construction stormwater permit and develop and implement a SWPPP that identifies BMPs and construction measures to contain soils and to minimize discharge of sediment during stormwater events.

MPCA, Section 401, Clean Water Act

The MPCA requires Section 401 water quality certification to obtain a federal permit for any activity potentially resulting in discharge to waters of the United States. This certification ensures the Project will comply with state water quality standards according to the CWA.

MNDNR, License to Cross Public Waters or State Lands

A MNDNR Utility License is required for the passage of any utility over, under, or across any public land or public waters. The MNDNR Division of Lands and Minerals is responsible for granting approval in the form of a crossing license. In addition to a long-term license fee, there is a one-time crossing fee for each waterbody crossed. Agency review time of the application varies depending on the crossing technique and involves review and approval from several state departments and associated divisions.

MNDNR, Threatened and Endangered Species Consultation

Pursuant to Minnesota's Endangered Species Statute, the MNDNR is required to adopt rules designating species meeting the statutory definitions of endangered, threatened, or species of special concern and regulate treatment of these species. After receiving a Route Permit, DCW will consult with the MNDNR regarding any Project-specific construction considerations related to Minnesota's Endangered Species Statute.

MN/DOT, Utility Permit

The Applicants will apply for a Utility Accommodation on Trunk Highway Right of Way (Form 2525). This permit is required for the construction of utility facilities crossing or paralleling existing trunk highway ROW.

MN/DOT, Driveway Access Permit

The Applicants will apply for an Access/Driveway Permit (Form 1721) for using driveways and access points to trunk highways crossed or paralleled by the Project during construction.

MN/DOT, Oversize/Overweight Permits

The Applicants will apply for oversize and/or overweight permits for all vehicles using state trunk highways during construction and operation of the Project. These permits are required for vehicle loads of excess height, length, and/or weight, although overlength utility poles may be exempt. Certain overwidth and/or overlength loads require escorts, which the Applicants will arrange as necessary.

Minnesota Department of Agriculture Mitigation Plan

The Applicants will develop an Agriculture Mitigation Plan for the Project. Applicants will consult with the Minnesota Department of Agriculture to develop a plan that details the measures to be implemented during construction of the Project to avoid, mitigate, or compensate for impacts on agricultural lands that may occur during construction. This plan will describe measures and BMPs used in agricultural land to minimize any negative impacts on cultivated fields and drain tile systems. Landowners would be compensated for any loss of or damage to crops, or for lands that cannot be planted because of Project construction activities.

8.7.3 Local Permits

Once the Commission issues a Route Permit, local zoning, building and land use regulations and rules are preempted per Minn. Stat. Section 216E.10, subd. 1. Applicable permits from Dodge and Olmsted related to road access, road ROW, floodplains, and wetlands under Minnesota Wetland Conservation Act will be secured as needed for the Project.

The Applicant is coordinating with Dodge County and Olmsted County on the placement of structures outside of the 100-year floodplain, to the extent possible, as both counties have ordinances related to the placement of structures within the floodplain.

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