APPLICATION FOR A LARGE WIND ENERGY CONVERSION SYSTEM SITE PERMIT

Rose Creek Wind, LLC

Mower County, Minnesota

IP7065/WS-21-643

Prepared by:

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TABLE OF CONTENTS

1.0 APPLICANT INFORMATION 1
1.1 LETTER OF TRANSMITTAL SIGNED BY AN AUTHORIZED REPRESENTATIVE OR AGENT OF THE APPLICANT 2
1.2 NAME, ADDRESS, AND TELEPHONE NUMBER OF THE APPLICANT AND ANY AUTHORIZED REPRESENTATIVE 2
1.3 ROLE OF THE PERMIT APPLICANT IN THE CONSTRUCTION AND OPERATION OF THE LWECS 2
1.4 STATEMENT OF OWNERSHIP AND LIST OF ANY OTHER LWECS OR OTHER ENERGY FACILITIES LOCATION IN MINNESOTA IN WHICH THE APPLICANT, OR A PRINCIPAL OF THE APPLICANT, HAS AN OWNERSHIP OR OTHER FINANCIAL INTEREST 3

2.0 CERTIFICATE OF NEED 4

3.0 STATE POLICY 5

4.0 PROJECT DESCRIPTION AND OVERVIEW 6
4.1 PROJECT LOCATION 6
4.2 SIZE OF THE PROJECT SITE 6
4.3 RATED CAPACITY 6
4.4 NUMBER OF TURBINES AND ALTERNATE TURBINE LOCATIONS 6
4.5 METEOROLOGICAL TOWERS 6
4.6 WIND RIGHTS SECURED 7

5.0 PROJECT DESIGN 7
5.1 DESCRIPTION OF PROJECT LAYOUT 7
5.2 DESCRIPTION OF TURBINES AND TOWERS 9
5.3 DESCRIPTION OF THE ELECTRICAL SYSTEM 11
5.3.1 Electrical Collection System 11
5.3.2 Transformers 11

6.0 DESCRIPTION AND LOCATION OF ASSOCIATED FACILITIES 11
6.1 SUBSTATION, TRANSMISSION, AND INTERCONNECT 11
6.2 ASSOCIATED FACILITIES 12
6.2.1 O&M Facility 12
6.2.2 Permanent Meteorological Tower 12
6.2.3 Turbine Access Roads and Temporary Laydown Yard 12

7.0 WIND RIGHTS 13

8.0 ENVIRONMENTAL IMPACTS 14
8.1 DEMOGRAPHICS 14
8.1.1 Existing Resources 14
8.1.2 Potential Impacts 15
8.1.3 Mitigation Measures 15
8.2 LAND USE 15
8.2.1 Existing Resources 15
8.2.2 Potential Impacts 18
8.2.3 Mitigation Measures 18
8.3 CONSERVATION EASEMENTS AND CONTRACTS 19
8.3.1 Existing Resources 19

8.3.2 Potential Impacts....20
8.3.3 Mitigation Measures....20
8.4 SOUND....20
8.4.1 Existing Resources....20
8.4.2 Potential Impacts....20
8.4.3 Mitigation Measures....23
8.5 VISUAL IMPACTS....23
8.5.1 Existing Resources....23
8.5.2 Potential Impacts....25
8.5.3 Mitigation Measures....27
8.6 PUBLIC SERVICES AND INFRASTRUCTURE....28
8.6.1 Existing Resources....28
8.6.2 Potential Impacts....30
8.6.3 Mitigation Measures....33
8.7 CULTURAL AND ARCHAEOLOGICAL RESOURCES....34
8.7.1 Existing Resources....35
8.7.2 Potential Impacts....36
8.7.3 Mitigation Measures....37
8.8 RECREATION....37
8.8.1 Existing Resources....37
8.8.2 Potential Impacts....39
8.8.3 Mitigation Measures....39
8.9 PUBLIC HEALTH AND SAFETY....39
8.9.1 Existing Resources....39
8.9.2 Potential Impacts....40
8.9.3 Mitigation Measures....40
8.10 HAZARDOUS MATERIALS....41
8.10.1 Existing Resources....41
8.10.2 Potential Impacts....41
8.10.3 Mitigation Measures....42
8.11 LAND-BASED ECONOMIES....42
8.11.1 Existing Resources....42
8.11.2 Potential Impacts....43
8.11.3 Mitigation Measures....44
8.12 TOURISM....45
8.12.1 Existing Resources....45
8.12.2 Potential Impacts....45
8.12.3 Mitigation Measures....46
8.13 LOCAL ECONOMIES AND COMMUNITY BENEFITS....46
8.13.1 Existing Resources....46
8.13.2 Potential Impacts....46
8.13.3 Mitigation Measures....47
8.14 TOPOGRAPHY....47
8.14.1 Existing Resources....47
8.14.2 Potential Impacts....48
8.14.3 Mitigation Measures....48
8.15 SOILS....48
8.15.1 Existing Resources....48
8.15.2 Potential Impacts....49
8.15.3 Mitigation Measures....50
8.16 GEOLOGIC AND GROUNDWATER RESOURCES....50

8.16.1 Existing Resources....50
8.16.2 Potential Impacts....51
8.16.3 Mitigation Measures....51
8.17 SURFACE WATER AND FLOODPLAIN RESOURCES....51
8.17.1 Existing Resources....51
8.17.2 Potential Impacts....53
8.17.3 Mitigation Measures....54
8.18 WETLANDS....54
8.18.1 Existing Resources....54
8.18.2 Potential Impacts....55
8.18.3 Mitigation Measures....56
8.19 VEGETATION....56
8.19.1 Existing Resources....56
8.19.2 Potential Impacts....57
8.19.3 Mitigation Measures....57
8.20 WILDLIFE....58
8.20.1 Existing Resources....58
A report describing the results of acoustic bat surveys will be submitted to the MNDNR and MNDOC in the first quarter of 2022.Migratory Waterfowl Feeding and Resting Areas....63
8.20.2 Potential Impacts....63
8.20.3 Mitigation Measures....67
8.21 RARE AND UNIQUE NATURAL RESOURCES....67
8.21.1 Existing Resources....68
8.21.2 Potential Impacts....72
8.21.3 Mitigation Measures....74

9.0 SITE CHARACTERIZATION OF WIND RESOURCES....74
9.1 DESCRIPTION OF RESOURCES....74
9.1.1 Interannual Variation....74
9.1.2 Seasonal Variation....74
9.1.3 Diurnal Conditions....78
9.1.4 Atmospheric Stability....81
9.1.5 Turbulence....81
9.1.6 Extreme Conditions....81
9.1.7 Speed Frequency Distribution....81
9.1.8 Variation with Height....83
9.1.9 Spatial Variations....83
9.1.10 Wind Rose....84
9.1.11 Other Meteorological Conditions....86
9.2 OTHER WIND TURBINES....86

10.0 PROJECT CONSTRUCTION....87
10.1 ROADS AND INFRASTRUCTURE....87
10.2 ACCESS ROADS....88
10.3 OTHER ASSOCIATED FACILITIES....88
10.4 TURBINE SITE LOCATION....89
10.5 POST-CONSTRUCTION CLEANUP AND SITE RESTORATION....89
10.6 OPERATION OF PROJECT....89
10.7 COSTS....90
10.8 SCHEDULE....90
10.9 ENERGY PROJECTIONS....90

11.0 DECOMMISSIONING AND RESTORATION 91

12.0 IDENTIFICATION OF OTHER POTENTIAL PERMITS 93

13.0 REFERENCES 95

LIST OF TABLES

Table 1.4-1 Energy Facilities Owned and Operated by CED in Minnesota 3
Table 4.1-1 Project Location 6
Table 5.1-1 Setback Requirements 8
Table 5.2-1 Wind Turbine Characteristics 10
Table 8.1.1-1 Demographic Data for the State, County, and Townships of the Project 15
Table 8.2.1-1 Comprehensive Plans and Zoning Ordinances for Local Governments within the Project Area 16
Table 8.4.2-1 Noise Standards 21
Table 8.4.2-2 Acoustic Modeling Results – Scenario 1 22
Table 8.4.2-3 Acoustic Modeling Results – Scenario 2 22
Table 8.5.2-1 Distribution of Occupied Structures and Modeled Shadow Flicker Results – Scenario 1 27
Table 8.5.2-2 Distribution of Occupied Structures and Modeled Shadow Flicker Results – Scenario 2 27
Table 8.6.1-1 Summary of Microwave Paths that Intersect the Microwave Study Area 28
Table 8.6.1-2 Licensed Off-Air TV Stations Subject to Disruption 29
Table 8.7.1-1 Previous Surveys within the Literature Search Study Area 35
Table 8.7.1-2 Previously Recorded Archaeological Sites in the Literature Search Study Area 36
Table 8.7.1-3 Previously Recorded Architectural Properties in the Literature Search Study Area 36
Table 8.8.1-1 Wildlife Management Areas within 10 miles (16.09 km) of the Project Boundary 38
Table 8.8.1-2 State and County Parks & Trails within 10 miles (16.09 km) of the Project 39
Table 8.11.1-1 Prime Farmland within the Project Site 42
Table 8.15.1-1 Soil Types within the Project Site 48
Table 8.17.1-1 PWI Watercourses within the Project Site 52
Table 8.18.1-1 Delineated and NWI Wetlands within the Project Site 54
Table 8.19.1-1 Land Cover Types within the Project Site 56
Table 8.20.1-1 Wildlife Studies within the Project Area 59
Table 8.21.1-1 Federally Listed Species Potentially Present in the Project Area 68
Table 8.21.1-2 State-Protected and Rare Species within 1 Mile (1.61 km) of the Project Boundary 69
Table 8.21.1-3 Sites of Biodiversity Significance within 1 Mile (1.61 km) of the Project Boundary 71
Table 8.21.1-4 Native Plant Communities within 1 Mile (1.61 km) of the Project Boundary 72
Table 9.1.8-1 Mean Wind Speed by Height 83
Table 9.1.8-2 Shear by Height 83
Table 9.2-1 Turbines within 10 Miles of the Project 86
Table 10.8-1 Project Schedule 90
Table 11-1 Decommissioning Plan Site Permit Application Guidance Matrix 92

Table 12-1 Potential Permits and Approvals Required for Construction and Operation 93

LIST OF DIAGRAMS

Diagram 9.1.2-1 Seasonal 80 m (262.47 ft) Wind Speed Variation 75
Diagram 9.1.2-2 Seasonal 80 m (262.47 ft) Wind Direction Frequency 76
Diagram 9.1.2-3 Seasonal 80 m (262.47 ft) Wind Direction Frequency 77
Diagram 9.1.3-1 80 m (262.47 ft) Mean Diurnal Wind Speed Profile 79
Diagram 9.1.3-2 80 m (262.47 ft) Diurnal Wind Direction Frequency 80
Diagram 9.1.7-1 80 m (262.47 ft) Wind Speed Frequency Distribution 82
Diagram 9.1.9-1 Spatial Variation of 80 m (262.47 ft) Wind Speed 84
Diagram 9.1.10-1 80 m (262.47 ft) Wind Direction Frequency 85

LIST OF FIGURES

Figure 1 Project Location
Figure 2a Project Area and Existing Facilities
Figure 2b Proposed Substation Expansion
Figure 2c Project Area and Proposed Facilities
Figure 3 Public Land Ownership and Recreation
Figure 4a Turbine Layout and Constraints – Scenario 1
Figure 4b Turbine Layout and Constraints – Scenario 2
Figure 5 Existing Wind Turbine Locations
Figure 6 Land Cover
Figure 7 Zoning
Figure 8 Topographic Map
Figure 9 FEMA Floodplain
Figure 10 Wetlands Inventory
Figure 11 Surface Waters
Figure 12 Unique Natural Features
Figure 13 Soils
Figure 14 Site Geology and Depth to Bedrock
Figure 15 Land Ownership
Figure 16 Microwave Beam Path
Figure 17a Sound Modeling – Scenario 1
Figure 17b Sound Modeling – Scenario 2
Figure 18a Shadow Flicker – Scenario 1
Figure 18b Shadow Flicker – Scenario 2
Figure 19a Turbine Design – GE
Figure 19b Turbine Design – Gamesa

APPENDICES

Appendix A Agency Correspondence
Appendix B Phase Ia Cultural Resources Report – PUBLIC AND NONPUBLIC DOCUMENT
Appendix C Sound Report
Appendix D Shadow-flicker Report

Appendix E Telecommunications Reports
Appendix F Wetland/Waterbody Report
Appendix G Tier 1/Tier 2 Study
Appendix H 2021 Raptor Nest Survey Report
Appendix I Northern Long-eared Bat Habitat Assessment
Appendix J Bird and Bat Conservation Strategy
Appendix K Native Prairie Desktop Assessment
Appendix L Decommissioning Plan

ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
ACEP	Agricultural Conservation Easement Program
ADLS	Aircraft Detection Lighting System
BBCS	Bird and Bat Conservation Strategy
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BMPs	Best Management Practices
BWSR	Board of Water and Soil Resources
CED	Consolidated Edison Development, Inc. or ConEdison
cm	centimeters
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CWA	Clean Water Act
CWI	County Well Index
Dairyland	Dairyland Power Cooperative
dBA	decibels, A-weighted
DOC-EERA	Department of Commerce-Energy Environmental Review and Analysis
ECPG	Eagle Conservation Plan Guidance
ELF	extremely low frequency
EMF	electromagnetic fields
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FSA	Farm Service Agency
ft	feet
ft/s	feet per second
ft^2	square feet
GE	General Electric
IBA	Important Bird Areas
IPaC	Information for Planning and Conservation
km	kilometer
kV	kilovolt
kW	kilowatt
LGU	local government unit
LiDAR	Light Detection and Ranging
LWECS	Large Wind Energy Conversion System
m	meters
m/s	meters per second
m^2	square meters
MBS	Minnesota Biological Survey
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MNDNR	Minnesota Department of Natural Resources
Merjent	Merjent, Inc.
MET	Meteorological evaluation tower
MN DEED	Minnesota Department of Employment and Economic Development
MNDOC	Minnesota Department of Commerce

MnDOT	Minnesota Department of Transportation
MOU	Minnesota Ornithologists' Union
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
MW	megawatt
MWFRA	Migratory Waterfowl Feeding and Resting Areas
NAC	noise area classifications
NHD	National Hydrography Dataset
NHIS	Natural Heritage Information System
NIEHS	National Institute of Environmental Health Sciences
NLCD	National Land Cover Database
NLEB	northern long-eared bat
NPC	Native Plant Communities
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NWI	National Wetlands Inventory
O&M	operations and maintenance
OSA	Minnesota Office of the State Archaeologist
PCM	Post-Construction Monitoring
POI	point of interconnection
Project or Repower Project	Rose Creek Wind, LLC Project
PWI	Public Waters Inventory
RD	rotor diameters
REC	Recognized Environmental Conditions
RIM	Reinvest in Minnesota
Rose Creek or Applicant	Rose Creek Wind, LLC
SCADA	Supervisory Control and Data Acquisition
SDS	State Disposal System
SGCN	Species in Greatest Conservation Need
SHPO	Minnesota State Historic Preservation Office
SNA	scientific and natural area
SOBS	Sites of Biodiversity Significance
SPC	species of special concern
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
SWCD	Soil and Water Conservation District
SWPPP	Stormwater Pollution Prevention Plan
THPO	Tribal Historic Preservation Officers
TrendLine Insights	TrendLine Insights, LLC
TV	television
UDP	Unanticipated Discoveries Plan
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
V	volts
WCA	Wetland Conservation Act

WEG	Wind Energy Guidelines
WEST	Western EcoSystems Technologies, Inc.
WHO	World Health Organization
WIA	Walk-In Access
WIMN	What's in My Neighborhood
WRP	Wetlands Reserve Program

DEFINITIONS

For the purposes of this application, the following terms are used as defined here:

- **Project**: The proposed new wind energy facility.
- **Project Boundary**: A line drawn around the Project to depict the lands that are proposed to be used for Project infrastructure and including non-participating parcels that will have Project infrastructure within public rights-of-way adjacent to those parcels.
- **Project Site**: The parcels within the Project Boundary that are proposed to be used for Project infrastructure; participating Project parcels and public rights-of-way.
- **Project Area**: The general vicinity of the Project, to include lands outside of the Project Boundary generally within a few miles of the Project Site.

COMPLETENESS CHECKLIST

Minnesota Rule	Required Information	Application Section(s)
7854.0500	**Site Permit Application Contents**	
Subpart 1	**Applicant**	
A.	A letter of transmittal signed by an authorized representative or agent of the applicant	1.1
B.	The complete name, address, and telephone number of the applicant and any authorized representative	1.2
C.	The signature of the preparer of the application if prepared by an agent or consultant of the applicant	1.3
D.	The role of the permit applicant in the construction and operation of the LWECS	1.3
E.	The identity of any other LWECS located in Minnesota in which the applicant, or a principal of the applicant, has an ownership or other financial interest	1.7
F.	The operator of the LWECS if different from the applicant.	1.5
G.	The name of the person or persons to be the permittees if a site permit is issued	1.6
Subpart 2	**Certificate of Need or Other Commitment**	
A.	The applicant shall state in the application whether a certificate of need for the system is required from the commission and, if so, the anticipated schedule for obtaining the certificate of need. The commission shall not issue a site permit for an LWECS for which a certificate of need is required until the applicant obtains the certificate, although the commission may process the application while the certificate of need request is pending before the commission.	2.0
B.	The commission may determine if a certificate of need is required for a particular LWECS for which the commission has received a site permit application.	2.0
C.	If a certificate of need is not required from the commission, the applicant shall include with the application a discussion of what the applicant intends to do with the power that is generated. If the applicant has a power purchase agreement or some other enforceable mechanism for sale of the power to be generated by the LWECS, the applicant shall, upon the request of the commission, provide the commission with a copy of the document.	2.0
Subpart 3	**State Policy**	
	The applicant shall describe in the application how the proposed LWECS project furthers state policy to site such projects in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources.	3.0
Subpart 4	**Proposed Site**	
	The applicant shall include the following information about the site proposed for the LWECS and any associated facilities:	
A.	The boundaries of the site proposed for the LWECS, which must be delineated on a United States Geological Survey Map or other map as appropriate;	4.1 Figure 1 Figure 8
B.	The following characteristics of the wind at the proposed site:	9.1

Minnesota Rule	Required Information	Application Section(s)
7854.0500	**Site Permit Application Contents**	
	(1) interannual variation;	9.1.1
	(2) seasonal variation;	9.1.2
	(3) diurnal conditions;	9.1.3
	(4) atmospheric stability, to the extent available;	9.1.4
	(5) turbulence, to the extent available;	9.1.5
	(6) extreme conditions;	9.1.6
	(7) speed frequency distribution;	9.1.7
	(8) variation with height;	9.1.8
	(9) spatial variations; and	9.1.9
	(10) wind rose, in eight or more directions	9.1.10
C.	Other meteorological conditions at the proposed site, including the temperature, rainfall, snowfall, and extreme weather conditions; and	9.1.11
D.	The location of other wind turbines in the general area of the proposed LWECS.	9.2 Figure 5
Subpart 5	**Wind Rights**	
5.	The applicant shall include in the application information describing the applicant's wind rights within the boundaries of the proposed site.	7.0
Subpart 6	**Design of Project**	
A.	A project layout, including a map showing a proposed array spacing of the turbines	5.1 Figure 2c Figure 4
B.	A description of the turbines and towers and other equipment to be used in the project, including the name of the manufacturers of the equipment	5.2
C.	A description of the LWECS electrical system, including transformers at both low voltage and medium voltage	5.3.1, 5.3.2,
D.	A description and location of associated facilities	6.2.1, 6.2.2, 6.2.3 Figure 2
Subpart 7	**Environmental Impacts**	
A.	Demographics, including people, homes, and businesses	8.1
B.	Noise	8.4 Figure 17
C.	Visual impacts	8.5
D.	Public services and infrastructure	8.6
E.	Cultural and archaeological impacts	8.7 Figure 12
F.	Recreational resources	8.8 Figure 3
G.	Public health and safety, including air traffic, electromagnetic fields, and security and traffic	8.9
H.	Hazardous materials	8.10 Figure 14

Minnesota Rule	Required Information	Application Section(s)
7854.0500	**Site Permit Application Contents**	
I.	Land-based economics, including agriculture, forestry, and mining	8.11
J.	Tourism and community benefits	8.12
K.	Topography	8.14 Figure 8
L.	Soils	8.15 Figure 13
M.	Geologic and groundwater resources	8.16 Figure 14
N.	Surface water and floodplain resources	8.17 Figure 9 Figure 11
O.	Wetlands	8.18 Figure 10
P.	Vegetation	8.19 Figure 6
Q.	Wildlife	8.20
R.	Rare and unique natural resources	8.21 Figure 12
Subpart 8	**Construction of Project**	
	The applicant shall describe the manner in which the project, including associated facilities, will be constructed.	10.0, 10.1, 10.2, 10.3, 10.4, 10.5
Subpart 9	**Operation of Project**	
	The applicant shall describe how the project will be operated and maintained after construction, including a maintenance schedule.	10.6
Subpart 10	**Costs**	
	The applicant shall describe the estimated costs of design and construction of the project and the expected operating costs.	10.7
Subpart 11	**Schedule**	
	The applicant shall include an anticipated schedule for completion of the project, including the time periods for land acquisition, obtaining a site permit, obtaining financing, procuring equipment, and completing construction. The applicant shall identify the expected date of commercial operation.	10.8
Subpart 12	**Energy Projections**	
	The applicant shall identify the energy expected to be generated by the project.	10.9
Subpart 13	**Decommissioning and Restoration**	
A.	The anticipated life of the project	11.0
B.	The estimated decommissioning costs in dollars	11.0
C.	The method and schedule for updating the costs of decommissioning and restoration	11.0
D.	The method of ensuring that funds will be available for decommissioning and restoration	11.0

Minnesota Rule	Required Information	Application Section(s)
7854.0500	**Site Permit Application Contents**	
E.	The anticipated manner in which the project will be decommissioned and the site restored	11.0
Subpart 14	**Identification of Other Permits**	
	The applicant shall include in the application a list of all known federal, state, and local agencies or authorities, and titles of the permits they issue that are required for the proposed LWECS.	12.0

1.0 APPLICANT INFORMATION

ConEdison Development (CED), a New York renewable energy development and operations company doing business as Rose Creek Wind, LLC (Rose Creek or Applicant), is planning to re-power an existing wind energy facility in Mower County, Minnesota. The re-powered wind energy facility will be called the Rose Creek Wind Project (Project or Repower Project). Rose Creek Wind, LLC is a Delaware Limited Liability Company and is registered with the Minnesota Secretary of State. Rose Creek Wind, LLC is owned by Rose Wind Holdings, LLC, which is owned by CED.

The currently operating Rose Wind project, owned by CED via a holding company, Rose Wind Holdings, LLC, consists of 11 turbines that were built in 2004 and 2005 pursuant to Conditional Use Permits issued by Mower County (see Figure 2a). The up to 17.4 megawatts (MW) of electricity generated by Rose Wind is sold to Dairyland Power Cooperative (Dairyland) under an existing Power Purchase Agreement with CED. The 11 existing Rose Wind turbines range in size from 1.5 MW to 1.65 MW. They were originally developed by seven separate limited liability companies and are all connected to the same project substation. CED acquired Rose Wind from GM, LLC in 2015.

CED also owns Adams Wind, a four-turbine wind facility immediately adjacent to Rose Wind (Figure 2a). Adams Wind delivers power to Alliant Energy and will remain in operation. The four turbines that make up Adams Wind are not part of the Rose Creek Wind Project.

The proposed Repower Project will involve decommissioning the 11 Rose Wind turbines and constructing 6 to 7 new turbines with greater power outputs to continue to deliver up to 17.4 MW of electricity to Dairyland. Due to the larger rotor diameter and setback requirements, the new turbines will not be built in the same locations as the existing turbines but will be in the general vicinity. Project facilities will include the turbines, collector lines, gravel turbine access roads, and a temporary construction yard. Due to obstructions within the Project Site, including high voltage transmission lines (HVTL) and county drainage ditches, Rose Creek expects that cranes will be broken down between every turbine; therefore, crane paths will follow proposed access roads and will be within the completed field survey corridors. The Project will not include a meteorological evaluation tower (MET) or an operations and maintenance (O&M) facility. The Project will use the existing point of interconnection (POI) and the substation equipment will be upgraded due to the age of the existing equipment. The substation will have the same capacity and be at the same location as the existing facility; however, the footprint will be slightly larger.

Because the existing turbines were originally permitted by Mower County, the Repower Project does not have a Large Wind Energy Conversion System (LWECS) Site Permit from the Minnesota Public Utilities Commission (MPUC). The Repower Project will have a nameplate capacity of up to 17.4 MW. In accordance with Minnesota Statute 216F, which defines an LWECS as any combination of wind energy conversion systems (wind turbines) with a combined nameplate capacity of 5 MW or more, the proposed Project will require a LWECS Site Permit. Mower County's ordinance, Section 14-18.61, does not accept site permitting jurisdiction for wind projects between 5 MW and 25 MW in size.

Rose Creek Wind, LLC, respectfully submits this application to the MPUC for a Site Permit to construct and operate the Rose Creek Wind, LLC Project. CED anticipates Project construction starting in the third quarter of 2022, and to begin commercial operations in the third quarter of 2023.

1.1 LETTER OF TRANSMITTAL SIGNED BY AN AUTHORIZED REPRESENTATIVE OR AGENT OF THE APPLICANT

A letter of transmittal signed by an authorized representative is provided in a cover letter to this application submittal.

1.2 NAME, ADDRESS, AND TELEPHONE NUMBER OF THE APPLICANT AND ANY AUTHORIZED REPRESENTATIVE

The authorized representatives for the Applicant are:

Mark Noyes
President and Chief Executive Officer
Rose Creek Wind, LLC
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DocuSigned by:
Mark Noyes
C1A1B5CDD4F6444...
(signature)

Rose Creek Wind authorizes the following individuals to receive communications related to this application:

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1.3 ROLE OF THE PERMIT APPLICANT IN THE CONSTRUCTION AND OPERATION OF THE LWECS

Rose Creek Wind, LLC is developing, and will construct, own, and operate the Project.

1.4 STATEMENT OF OWNERSHIP AND LIST OF ANY OTHER LWECS OR OTHER ENERGY FACILITIES LOCATION IN MINNESOTA IN WHICH THE APPLICANT, OR A PRINCIPAL OF THE APPLICANT, HAS AN OWNERSHIP OR OTHER FINANCIAL INTEREST

The Applicant does not own or operate any other LWECS in Minnesota. CED owns and operates the following energy facilities in Minnesota:

TABLE 1.4-1

Energy Facilities Owned and Operated by CED in Minnesota

Facility Name	Facility Size	Location	Permitting Authority
Adams Wind	6 MW	Mower County	Mower County
Rose Wind	17.4 MW	Mower County	Mower County
CED Red Lake Falls Community Hybrid (Wind and Solar Hybrid) Project	4.6 MW	Red Lake County	Red Lake County, MN
Woodstock Hills, LLC Project	9.2 MW	Pipestone County	Pipestone County, MN
Valley View Wind Project	10 MW	Murray County	Murray County, MN

2.0 CERTIFICATE OF NEED

A Certificate of Need from the MPUC is not required because the Project's nameplate capacity will not exceed 50 MW (Minn. Stat. §§ 216B.2421 and 216B.243).

3.0 STATE POLICY

LWECS, which are any combination of wind turbines and associated facilities with the capacity to generate more than 5 MW of electricity, are regulated by Minn. Stat. 216F and Minnesota Administrative Rules Chapter 7854.

This Project was designed in accordance with the requirements in Minn. Stat. 216F.03 and has been sited in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources. In addition, the Project meets the criteria requirements under the Minnesota Administrative Rules Chapter 7854 and this application provides sufficient project design, wind resource, and technical information for a thorough evaluation of the Project.

As discussed in this application, the Project complies with MPUC siting guidelines. Other wind projects are present in the vicinity of this Project, and repowering this Project is consistent with the referenced state policy.

This application has been prepared following the Minnesota Department of Commerce-Energy Environmental Review and Analysis (DOC-EERA) Application Guidance for Site Permitting of Large Wind Energy Conversion Systems in Minnesota (DOC-EERA, 2019).

4.0 PROJECT DESCRIPTION AND OVERVIEW

4.1 PROJECT LOCATION

The Project is located in Lodi and Adams Townships in Mower County, Minnesota (see Figure 1). It is south of the City of Adams, MN and southwest of the City of Taopi, MN. Table 4.1-1 lists the section, township, and range in which the Project is located.

TABLE 4.1-1

Project Location

County	Township	Range	Sections
Mower	101 North	15 West	18, 30, 31
	101 North	16 West	13, 14, 15, 22, 23, 24, 25, 26, 27, 36

4.2 SIZE OF THE PROJECT SITE

The area within the Project Boundary is approximately 5,258 acres (2,128 hectares) in size and is shown on Figures 1 and 2. All Project facilities will be within the Project Boundary.

4.3 RATED CAPACITY

The rated nameplate capacity of the Project is up to 17.4 MW at the POI.

4.4 NUMBER OF TURBINES AND ALTERNATE TURBINE LOCATIONS

The Project's total capacity will be up to 17.4 MW, which will be generated using up to 7 wind turbines. The capacity will be generated by decommissioning the existing turbines and constructing new turbines. Rose Creek is considering two design scenarios, with up to three turbine types per scenario.

Scenario 1 would use a combination of two General Electric (GE) models including one GE 2.3 MW, 80 meter (m) hub height turbine, and five GE 2.82 MW, 89m hub height turbines, for a total of 6 wind turbines and one alternate turbine location.

Scenario 2 would use a combination of one GE 2.3 MW, 80m hub height turbine, 4 Gamesa 2.0 MW, 100m hub height turbines, and two GE 2.82 MW, 89m hub height turbines for a total of 7 wind turbines.

The two scenarios will have similar construction footprints, including identical turbine locations, collector lines, access roads/crane paths, and similar environmental impacts.

The current preliminary turbine layout accommodates both scenarios and includes one alternative wind turbine location under scenario 1. See Figure 4 for the preliminary layout.

4.5 METEOROLOGICAL TOWERS

The Project will not include the construction or use of any temporary or permanent MET towers. The existing Rose Wind and Adams Wind projects do not include MET towers.

4.6 WIND RIGHTS SECURED

As of the date that this application was e-filed with the MPUC, Rose Creek has land lease agreements or good neighbor agreements in place for all the private land required for construction and operation of the Project, with the exception of four parcels needing a good neighbor agreement for a wind access buffer setback. Rose Creek has secured contractual access to all parcels where infrastructure would be located. See section 7.0 for more information regarding wind rights.

At this time, Rose Creek is not requesting a variance from the Commission's wind access buffers or any other setback requirements.

5.0 PROJECT DESIGN

5.1 DESCRIPTION OF PROJECT LAYOUT

Prior to constructing the Repower Project, Rose Wind will decommission the 11 Rose Wind turbines pursuant to the terms of relevant conditional use permits.

The Repower Project will involve constructing 6 to 7 new turbines, each with a greater power output than the existing turbines. The new turbines will not be built in the same locations as the existing turbines but will be in the general vicinity. The Project nameplate capacity and point of interconnect will remain the same. The proposed Project layout is shown on Figure 4 and optimizes the available wind resource while minimizing impacts to land use and the environment.

Rose Creek plans to use existing roads when possible, but new permanent and temporary access roads will also be required. The use of existing roads may require temporary widening and increasing turning radii. The existing and the proposed new permanent access roads are identified on Project figures.

All Project infrastructure will be sited on leased land or within public road rights-of-way and Rose Creek has secured all but one land leases to accommodate setback requirements. As of the date this application was filed with the MPUC, Rose Creek has executed landowner agreements for all private land required to complete the Project (see Figure 15) with the exception of the four good neighbor agreements mentioned above. Additional details on site control are discussed in Section 7.0.

Turbines have been sited where Rose Creek has secured leases and in accordance with wind energy conversion facility siting criteria outlined in the MPUC's *Order Establishing General Wind Permit Standards*, Docket No. E, G999/M-07-1102 (January 11, 2008; MPUC, 2008). Table 5.1-1 summarizes the MPUC's setback standards, Mower County setback standards (where applicable), and the standards applied to the Project.

TABLE 5.1-1

Setback Requirements

Resource Category	Authority	Setback	Setback Applied to Project
Wind Access Buffer	MPUC	Wind turbine towers shall not be placed less than 5 rotor diameters (RD) on prevailing wind directions and 3 RD on the non-prevailing wind directions from the perimeter of the lands where the Permittee does not hold wind rights, without the approval of the MPUC. This section does not apply to public roads and trails.	3 RD (1,250 feet [ft], 381 m) on non-prevailing wind direction axis and 5 RD (2,083 ft, 635m) on prevailing wind direction axis using the largest of the proposed turbines with 418 ft (127 m) RD.
Internal Turbine Spacing	MPUC	The turbine towers shall be constructed within the site boundary as approved by the MPUC. The turbine towers shall be spaced no closer than 3 RDs in non-prevailing wind directions and 5 RD on prevailing wind directions. If required during final micro siting of the turbine towers to account for topographic conditions, up to 20 percent of the towers may be sited closer than the above spacing but the permittee shall minimize the need to site the turbine towers closer.	3 RD (1,250 ft, 381 m) on non-prevailing wind direction axis and 5 RD (2,083 ft, 635m) on prevailing wind direction axis using the largest of the proposed turbines with 418 ft (127 m) RD. All towers comply with the internal turbine spacing setback.
Public Roads	MPUC	The turbine towers shall be placed no closer than 250 ft (76.2 m) from the edge of public road rights-of way.	1.1X tip height (550 ft, 168 m)
Recreational Trails	MPUC	Setbacks from state trails and other recreational trails shall be considered on a case-by-case basis.	Minimum 250 ft
Homes	MPUC	At least 500 ft (152.4 m) and sufficient distance to meet noise standard.	1,500 ft from homes
Public Lands	MPUC	Wind turbines and associated facilities, including foundations, access roads, collector lines, and transformers shall not be located in public lands including Waterfowl Protection Areas, Wildlife Management Areas, Scientific and Natural Areas, or in county parks, and wind turbine towers shall also comply with the setbacks of Wind Access Buffers.	No turbines are located within public lands and they are setback from public lands by at least 3 RD (1,250 ft, 381 m) on non-prevailing wind direction axis and 5 RD (2,083 ft, 635m) on prevailing wind direction axis using the largest of the proposed turbines with 418 ft (127 m) RD.
Public Waters Wetlands	MPUC	No turbines, towers or associated facilities shall be located in public waters wetlands. However, electric collector and feeder lines may cross or be placed in public waters or public water wetlands subject to Minnesota Department of Natural Resources (MNDNR), U.S. Fish and Wildlife Service (USFWS), and/or U.S. Army Corps of Engineers (USACE) permits.	No turbines are located in National Wetlands Inventory (NWI) or Public Waters Inventory (PWI)-mapped wetlands or waterbodies, or their associated setbacks. One collector line will cross beneath a PWI waterbody via the bore method.
Native Prairie	MPUC	Wind turbines and all associated facilities, including foundations, access roads, underground cables, and transformers shall not be placed in native prairie unless addressed in a prairie protection and management plan.	Based on a desktop review, possible native prairie has been identified within the Project boundary. No turbines, or associated facilities will impact native prairie. The results of the desktop review will be field verified in spring 2022.

TABLE 5.1-1

Setback Requirements

Resource Category	Authority	Setback	Setback Applied to Project
Sand and Gravel Operations	MPUC	No turbines, towers or associated facilities in active sand and gravel operations, unless negotiated with the landowner.	No project infrastructure will be located within active sand and gravel operations.
Aviation (public and private airports)	MPUC, Minnesota Administrative Rule	No turbines, towers or associated facilities shall be located so as to create an obstruction to navigable airspace of public and private airports in Minnesota or adjacent states and/or providences. The Permittee shall apply the minimum obstruction clearance for airports pursuant to Minnesota Administrative Rule 8800.1900, Subpart 5. Setbacks or other limitations shall be followed in accordance with the Minnesota Department of Transportation (MnDOT), Department of Aviation, and Federal Aviation Administration (FAA).	Determinations of No Hazard will be obtained from the FAA.
Noise	MPUC	Project must meet Minnesota Noise Standards, Minnesota Rules Chapter 7030, at all residential receivers (homes). Residential noise standard NAC 1, L50 50 decibels using the A-weighted scale (dBA) during overnight hours.	All turbines are located greater than 1,500 ft (457m) from residences and meet Minnesota Noise Standards.
Public Waters	MNDNR Buffer Law (adopted by Mower County)	Public waters have designated 50-ft (15.24 m) protection buffer (MNDNR, 2019).	No permanent removal of vegetation within the designated buffer areas identified by the Mower County Buffer Ordinance will occur.
Microwave Beam Paths	Mower County, Minnesota	Wind farms and wind turbines over 5 MW regulated by the State of Minnesota are also prohibited from locating wind turbines within designated microwave beam paths or in an area that falls within a 1-mile (1.61-kilometer [km]) radius of the center point.	Turbines are not located within the designated microwave beams paths or in an area within a 1-mile (1.61 km) radius of the center point.
Public Waters	Mower County, Minnesota	Public Waters have a 300-ft (91.44-m) Shoreland Management Overlay district that regulates the subdivision, use, and development of shoreland areas (Mower County, 2002).	300 ft (91.44 m) on either side of Public Waters

Sources: Mower County, 20121a; MPUC, 2008.

5.2 DESCRIPTION OF TURBINES AND TOWERS

The Project is proposing to use a combination of two potential GE model wind turbines and one Gamesa model, including the GE 2.3 MW, 80 m (262.47 ft) hub height turbine; the GE 2.82 MW, 89 m (292 ft) hub height turbine; and the Gamesa 2.0 MW, 100 m (328.08 ft) hub height turbine. The characteristics of each turbine are summarized in Table 5.2-1 and depicted on Figures 19a and 19b. The selected turbines are each three-bladed, active yaw (designed to move the machine with respect to the wind direction), active blade pitch control (designed to regulate turbine rotor speed), and each has a generator/power electronic converter system.

TABLE 5.2-1

Wind Turbine Characteristics

Design Features	GE 2.3 MW	GE 2.82 MW	Gamesa 2.0 MW
Nameplate Capacity	2.3 MW	2.82 MW	2.0 MW
Hub Height	80 m (262.47 ft)	89 m (292 ft)	100 m (328.08 ft)
Rotor Swept Area	10,568 square meters (m^2) (113,753 square feet [ft^2])	12,704 m^2 (136,745 ft^2)	7,389.8 m^2 (79,543.15 ft^2)
Total Height (ground to fully extended blade tip)	138 m (452.76 ft)	152.5 m (500. ft)	168.5 m (553 ft)
Rotor Diameter	116 m (380.58 ft)	127 m (416.6 ft)	97 m (318.24 ft)
Cut-in Wind Speed	3.0 m/s (9.84 feet per second [ft/s]) at hub height	3.0 m/s (9.84 ft/s) at hub height	3.0 m/s (9.84 ft/s) at hub height
Cut-out Wind Speed	• 22 meters per second (m/s)	• 30 m/s (98 ft/s) average in a 600-second time interval. • 35 m/s (115 ft/s) in a 30-second time interval • 39 m/s (128 ft/s) average in a 3-second time interval.	25 m/s
International Electrotechnical Commission Wind Class	Not available in manufacture's turbine specifications	Not available in manufacture's turbine specifications	Not available in manufacture's turbine specifications
Rotor speed	Rotor speed range: 8 to 15.7 revolutions per minute	Rotor speed range: 7.4 to 15.7 revolutions per minute	Rotor speed range: 9 to 19 revolutions per minute.
Supervisory Control and Data Acquisition (SCADA) System	The wind turbine machine can be controlled automatically or manually from either an interface located inside the nacelle or from a control box at the bottom of the tower. Control signals can also be sent from the remote computer via a SCADA, with local lockout capability provided at the turbine controller.	The wind turbine machine can be controlled automatically or manually from either an interface located inside the nacelle or from a control box at the bottom of the tower. Control signals can also be sent from the remote computer via a SCADA, with local lockout capability provided at the turbine controller.	The turbines are integrated in the SCADA system, enabling wind farm information access via simple and intuitive browser.
FAA lighting	As required by FAA	As required by FAA	As required by FAA

Each turbine type includes tower sections, nacelle, hub, and three blades. The towers are comprised of cylindrical, tapered steel consisting typically of sections joined together via factory-fabricated welds, which are automatically controlled and ultrasonically inspected during manufacturing per American National Standards Institute specifications. Surfaces are coated for protection against corrosion and will be painted. Each turbine can be accessed through a lockable steel door at the base of the tower, through which the nacelle and turbine blades can be accessed. Inside each tower, platforms are accessible via ladders that are equipped with fall arresting safety systems. Interior lights are factory installed at interval points from the base of the tower to the tower top.

Each turbine tower base will have a control panel housing electronic and communication equipment. The nacelle equipment includes a sensor that detects wind speed and direction to signal conditions for safe operation. Each turbine is equipped with variable-speed control and independent blade pitch to enhance efficiency. An automated SCADA system located at the Project Site will provide remote supervision and control of turbine equipment and performance.

Foundation designs will be dependent on final turbine selection and the pending geotechnical investigation. The actual foundation dimensions will be established after completion of site-specific geotechnical investigations and mechanical loading analysis that will be performed to

support final engineering design. During construction, typically a temporary 200-foot-wide disturbed area around the base of the turbine will be used for construction purposes. A 32-foot-diameter permanent above ground gravel area will be installed to facilitate access to the turbine during operations.

5.3 DESCRIPTION OF THE ELECTRICAL SYSTEM

5.3.1 Electrical Collection System

Each turbine will have a pad-mounted step-up transformer at the tower base to deliver electricity to the collection system. The Project will use 34.5 kilovolt (kV) underground electrical conductors to collect electricity from the turbines and transmit it to the project substation through approximately 8.5 miles (13.7 km) of underground 34.5 kV collector lines. The underground cables will be installed in a trench that is approximately 50” to 54” (1.27 to 1.37 m) deep. Underground cables will also be installed via directional drilling where preferred or required. The collection system design will meet the standards of the National Electric Safety Code.

5.3.2 Transformers

Power from the turbines is fed through a breaker panel at the turbine’s base inside the towers and is interconnected to a pad-mounted step-up transformer, which steps the voltage up from 690 volts (V) to 34.5 kV. Protection for the wind turbine is provided by a breaker at the turbine down-tower cabinet, located inside the tower and at the Project’s substation.

6.0 DESCRIPTION AND LOCATION OF ASSOCIATED FACILITIES

Figure 4 shows the proposed locations of wind turbines, underground collection lines, access roads, and other associated Project facilities.

6.1 SUBSTATION, TRANSMISSION, AND INTERCONNECT

Because the proposed Project will supply the same amount of electricity to the same POI location as the existing Rose Wind facility, no additional transmission will be required. The existing 34.5 kV overhead electrical line that connects the Project substation to the 69 kV Dairyland electric transmission line will be replaced with a new overhead line of the same size during the substation upgrades. The new 34.5 kV connection, or “gen-tie,” line will be placed in generally the same alignment as the existing line, which is approximately 65’ long from its origin within the existing substation to the Dairyland transmission line. Both the substation and the gen-tie line are owned by Rose Wind Holdings, LLC and will be refurbished by the Project.

New replacement equipment will be installed at the existing substation for the operation of Rose Creek. The substation equipment will be installed on concrete foundations and consist of a gravel footprint with a chain-link perimeter fence, and an outdoor lighting system. The basic elements of the substation include a control house, transformer, outdoor breaker, relaying equipment, steel support structures, and overhead lightning suppression conductors.

The POI for the Project will remain the existing 69 kV project substation owned and operated by Rose Wind Holdings, LLC. The substation is located on the west side of 660th Avenue (Figure 4). The existing substation will be upgraded with similar new equipment with a slightly larger footprint (see Figure 2b). The final design for the updated substation will be completed prior to Project construction and provided to MPUC as part of the pre-construction site plan. The upgraded

substation will be approximately 80’ X 125’, which is slightly larger than the existing substation (approximately 75’ X 100’). The placement of the upgraded substation will be such that no new impacts to wetlands or waterbodies will occur.

6.2 ASSOCIATED FACILITIES

6.2.1 O&M Facility

Due to the small size of the Project, Rose Creek will not construct an O&M facility at the Project Site. Instead, O&M of the Project will be performed out of the regional O&M facility in Pipestone, Minnesota, as is currently done for the Rose Wind and Adams Wind facilities. Additional details on the operation and maintenance of the Project are found in Section 10.6 – Operation of the Project.

6.2.2 Permanent Meteorological Tower

Rose Creek will not construct a permanent MET tower, and no MET towers exist at Rose Wind or Adams Wind.

6.2.3 Turbine Access Roads and Temporary Laydown Yard

Each turbine will have a gravel access road that will connect the turbine from the public road network to the turbine locations. Existing access roads will be used to the extent possible and new access roads will be designed in an efficient manner. Existing access roads may be widened or modified as appropriate. The roads will be all-weather gravel construction and approximately 16 ft to 18 ft (4.88 m – 5.49 m) wide once the Project is operational. Approximately 1.17 miles (2.74 km) of existing Rose Wind access roads will be used for Rose Creek and approximately 2.64 miles (4.25 km) of new access roads will be constructed. Temporary road access will be approximately 40 ft wide.

Due to obstructions within the Project Site, including HVTL and county drainage ditches, Rose Creek anticipates that cranes will be broken down between every turbine; therefore crane paths will follow proposed access roads and will be within the completed field survey corridors. The Project will also require grading of a temporary equipment laydown area of approximately 5-7 acres. The temporary laydown area will serve as a location for parking during construction, office trailers, and storage and staging for materials used in construction. The location of the temporary laydown area will be identified prior to construction and the location will be provided to the PUC when available.

A concrete batch plant will not be required for the Project. Concrete for turbine foundations will be delivered from a local supplier.

All permanent and temporary access roads/crane paths, collector lines, and the laydown yard will be permitted as part of the LWECS Site Permit (see Figure 2c).

7.0 WIND RIGHTS

Most Project infrastructure will be sited on land leased by CED, with some collection lines being located within township and county road rights-of-way. Rose Creek has secured 95% of land leases required to accommodate setback requirements and Project infrastructure and is working with township and county officials to secure rights to public road rights-of-way where required. The Project Site is approximately 5,258 acres (2,127 hectares) in total area. As of the date this application was e-filed with the MPUC, Rose Creek has executed landowner agreements for all of the private land required to complete the Project, except for four good neighbor agreements (T-1 and T-2 wind access buffers) for which the Project is in active negotiations. Participating and non-participating parcels and landowners are shown on Figure 4 (Turbine Layout and Constraints) and Figure 15 (Land Ownership). The secured easement agreements will ensure access for construction and operation of the Project and identify the obligations and responsibilities of the landowners and Rose Creek. Rose Creek's leasehold is sufficient to accommodate the proposed Project in compliance with the setback requirements identified in Table 5.1-1 above.

8.0 ENVIRONMENTAL IMPACTS

The assessment of potential environmental impacts in Section 8.0 of this application has been completed to satisfy Minn. R. 7854.0500, subpart 7. In each section, existing conditions, potential impacts, and mitigation measures are discussed. As part of Project development and in preparation for this application, Rose Creek initiated coordination with applicable regulatory agencies, including the MNDNR, the U.S. Fish and Wildlife Service (USFWS), and the Minnesota State Historic Preservation Office (SHPO). Rose Creek has also actively communicated Project information and updates. A detailed list of agency outreach and responses can be found in Appendix A (Agency Correspondence).

8.1 DEMOGRAPHICS

8.1.1 Existing Resources

The Project Site is in a rural, agricultural region in southeastern Minnesota. The Project Boundary includes both Adams and Lodi Townships in Mower County, Minnesota, while all Project infrastructure will be in Adams Township. No municipalities are within the Project Site. The City of Adams is directly north of the Project and the City of Taopi is 1.5 miles northeast. The City of Austin, located approximately 15 miles (24.14 km) northwest of the Project Site, is the county seat and largest city in Mower County. According to the U.S. Census Bureau, the population estimate for Mower County in 2019 was 40,062, with a population density of 55.1 individuals per square mile (21 individuals per square km) (U.S. Census, 2021a). Mower County has seen a 2.3% population increase from 2010 to 2019 in comparison to the State of Minnesota with a 6.3% increase (U.S. Census, 2021a; 2021b).

Based on field observations, approximately 23 occupied residences and some agricultural-related businesses are located within the Project Site. In 2019, the population of Adams was 755 and the population of Taopi was 51 (U.S. Census, 2021e; 2021f). Both cities are small rural communities with numerous small businesses including retail, veterinarian services, financial services, and cafes.

Environmental Justice

According to the U.S. Environmental Protection Agency (EPA), Environmental Justice is the ‘fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies’ (EPA, 2021a). Environmental Justice involves a responsibility by local, state, and federal governments to consider the potential impacts of official actions to all demographic groups in the Project Area, and to avoid actions that place an uneven burden on disadvantaged groups (for instance, minority populations).

The total minority population in Mower County, that is the total population minus the White alone, not Hispanic or Latino population, is 23.3%, which is somewhat higher than surrounding counties. Freeborn County’s minority population is 16.2% and Fillmore County’s is 4%. Mower County’s minority population is largely found in Austin. Overall, Mower County is more diverse than surrounding counties and the State of Minnesota average. The largest minority group in Mower County is comprised of persons who identify as Hispanic or Latino, at 12.2% of the total population. Compared to the State of Minnesota, Mower County has more people below the poverty line, and a lower household income; however, approximately 73% of the housing units

are occupied, which is 1.4 % higher than the overall State of Minnesota (U.S. Census, 2021a; 2021b).

Based on the Minnesota Pollution Control Agency's (MPCA) "Understanding Environmental Justice in Minnesota" mapping tool, there are no Environmental Justice populations within the Project Area (MPCA, 2021a). Minority groups in Adams and Lodi Townships comprise 6.1% and 3.8% of the total populations in each township, respectively.

U.S. Census Bureau demographic profile data for Minnesota and Mower County are provided in Table 8.1.1-1.

TABLE 8.1.1-1

Demographic Data for the State, County, and Townships of the Project

Location	Population	Occupied Housing Units	Minority Population	Per-capita Income	Individuals Below the Poverty Line
Minnesota	5,639,632	2,477,753	20.9%	$37,625	9%
Mower County	40,062	17,092	23.3%	$29,720	11.5%
Lodi Township	211	89	3.8%	$39,688	8.1%
Adams Township	461	176	6.1%	$39,205	5.4%

Sources: U.S. Census 2021a; 2021b; 2021c; 2021d.

8.1.2 Potential Impacts

The Project is not anticipated to have significant impacts to demographics in the Project Area or in Mower County. The construction and operation of the Project will not displace residents or change the demographics of the Project Area. No significant demand increases for long-term housing are anticipated from operation of the Project, and short-term housing demands during construction are expected to be met through nearby lodging providers such as hotels, motels, and RV parks.

8.1.3 Mitigation Measures

No mitigation measures are proposed because the Project is not expected to change the demographics in the Project Area.

8.2 LAND USE

8.2.1 Existing Resources

Local Zoning and Comprehensive Plans

Comprehensive plans are typically developed by local municipalities as community planning tools to guide future land use and growth. In addition, comprehensive plans typically include goals and objectives regarding transportation, demographics, community facilities and infrastructure, housing trends, economic development, natural resources, and spending policies. As such, comprehensive plans do not have the force of law, but are forward-looking to help the community make decisions that could affect future growth.

In contrast, local zoning is a regulatory tool represented in municipal and county ordinances for the purpose of enforcing a community's land use preferences. Zoning ordinances are enforceable

on proposed private developments within a community's geographic jurisdiction, such as city limits or the zoned areas of a county.

Rose Creek reviewed Mower County's 2002 Comprehensive Plan, which includes land use planning for the townships within the Project Area. Table 8.2.1-1 provides an inventory of governing bodies within the Project Area, along with their respective comprehensive plans and zoning ordinances, if available.

TABLE 8.2.1-1

Comprehensive Plans and Zoning Ordinances for Local Governments within the Project Area

Local Government	Plan Name	Year Adopted/ Updated	Associated Development Plans
Mower County	Mower County Comprehensive Plan	2002	Mower County Comprehensive Plan
Mower County	Mower County Zoning Ordinance	2003/2015	Article Two – Land Use Districts Article Three – Floodplain Management Ordinance
Mower County	Mower County Buffer Ordinance	2017	NA
Adams Township	Not Adopted [a]	NA	Mower County Comprehensive Plan
Lodi Township	Not Adopted [a]	NA	Mower County Comprehensive Plan

[a] While these townships have not adopted their own comprehensive plans, both are included in the 2002 Mower County Comprehensive Plan.

The stated purpose of Mower County's Comprehensive Plan (Mower County, 2002) is "to identify problems, opportunities, issues and needs, and organize public policy to deal with them in a manner that serves the best interests of the greatest number of people." The Comprehensive Plan is a statement of public policy based upon a common vision and embodied goals of Mower County (Mower County, 2002).

Current and Future Zoning

The Mower County Zoning Ordinance (Mower County, 2021a) applies to all areas of Mower County excluding incorporated limits of municipalities. The City of Adams is adjacent to the northern Project Boundary and has its own Planning and Zoning Ordinance; however, the entire Project occurs outside of the incorporated areas and, as such, would not be subject to city jurisdiction. The City of Taopi is approximately 1.5 miles east of the eastern Project Boundary and does not have a zoning ordinance.

To regulate land use, the Mower County Zoning Ordinance establishes 10 zoning and/or overlay districts, which are as follows:

- Agricultural;
- Rural Management;
- Urban Expansion;
- Rural Residence;
- Business;
- Freeway Interchange Management;
- Industrial;
- Shoreland Management Overlay;
- Rural Service Center; and
- Planned Unit Development.

According to Mower County Zoning Maps (Mower County, 2021b), the Project falls entirely within the Agricultural District (Figure 7). The Zoning Ordinance also includes a Shoreland Management Overlay District, which may apply to new development within 300 ft (91.44 m) of PWI-listed waterways (see Figure 7). The Project Site currently contains an existing wind farm surrounded by agricultural land. The Project will involve the replacement of existing turbines with new turbines in the same general vicinity, and the surrounding area will remain in agricultural use. As such, no significant change to land use is proposed.

Per the Mower County Zoning Ordinance (Mower County, 2021a), the intent of the Agricultural District is: "to provide a district which will allow suitable areas of the County to be retained in agricultural use; regulate scattered non-farm development; regulate wetlands and woodlands, which, because of their unique physical features provide a valuable natural resource; and secure economy. To provide a district that will retain, conserve, and enhance agricultural land in the County and to protect this land from necessary urban encroachment including scattered residential development."

The intent of the Shoreland Management Overlay policy is to regulate the subdivision, use, and development of shoreland areas to: (1) protect and enhance the quality of surface waters; (2) preserve the natural environmental values (steep slopes, vegetation, and wildlife); (3) promote wise utilization of waters related to land resources; and (4) preserve historic values (Mower County, 2021a). Shoreland is located within 1,000 ft (304.8 m) of the normal high-water mark of a lake, pond, or flowage; and within 300 ft (91.44 m) of any river or stream, or the landward extent of a floodplain designated by ordinance on a river or stream, whichever is greater. Per the County's Zoning Ordinance Section 14-90, the Shoreland Overlay regulations apply to all public waters in the unincorporated areas of Mower County (Mower County, 2021a). Within the Project Site, Shoreland Management Overlay occurs within 300 ft (91.44 m) of one public waterway in the north central portion of the Project (Figure 7).

Within the Zoning Ordinance, Mower County also maintains a Floodplain Management Ordinance (Article III), which applies to all Floodway, Flood Fringe, or General Floodplain areas within the county. The Floodway, Flood Fringe and General Floodplain Districts are overlay districts that are superimposed on all existing zoning districts, and therefore may incorporate additional standards. Within the Floodway, Flood Fringe and General Floodplain Districts, all uses not listed as permitted uses or conditional uses per the County Zoning Ordinance are prohibited. There are no mapped floodplains that fall within the Project (see Figure 9).

The Mower County Zoning Ordinance outlines special requirements for wind energy conversion facilities with a rated capacity of 100 kilowatt (kW) or less and between 100 kW and 5 MW (Zoning Ordinance Sections 14-18.5 and 14-18.6). Per the ordinance, wind energy conversion systems are a permitted use within agricultural districts if they are 100 kW or less and are allowed as a conditional use if between 100 kW and 5 MW. The existing Rose Wind turbines were sited following the then-current Ordinance. The Project will have a total capacity of 17.4 MW; therefore, the County requirements do not apply to the Rose Creek Wind Project.

Per the Mower County Ordinance (Section 14-18.61), wind farms and wind turbines over 5 MW and regulated by the State of Minnesota are prohibited from locating wind turbines along designated microwave beam paths. Existing communication systems in proximity to the Project are further discussed in Section 8.6.

Provisions in Minnesota Statute 103F.48 (Buffer Law) allow a county or watershed district jurisdiction to carry out the compliance provisions regarding riparian vegetated buffers and

alternative water quality practices for those waterbodies identified on the MNDNR's Buffer Protection Map (MNDNR, 2021a). Mower County adopted the Mower County Buffer Ordinance on November 7, 2017. The goal of this ordinance is to provide for riparian vegetated buffers and protect water resources, through the implementation of requirements in Minnesota Statute 103F.48.

All turbines associated with the Project are located within the Agricultural District. Rose Creek plans to site turbines and any associated aboveground facilities outside of the Shoreland Management Overlay District. Because the Project will involve decommissioning of existing turbines and constructing new turbines in the vicinity, the Project will continue to be compatible with the existing Mower County zoning ordinance. If any new shoreland crossings or land use changes occur as a part of the Project, Rose Creek will comply with the applicable regulations, as necessary.

8.2.2 Potential Impacts

The Project is consistent with the Mower County Comprehensive Plan's goals to conserve prime agricultural lands for long-term agricultural use, conserve and enhance the County's rich natural resource base, and maintain healthful living environments and compatible land use relationships. Since there are existing wind turbines that are considered compatible with the goals of the Comprehensive Plan, the replacement wind turbines will continue to be compatible with the stated goals of the Comprehensive Plan.

The Project is not likely to impact future zoning and expansion of incorporated areas in the Project Area. Urban Expansion Districts are intended to designate areas of the County where urban development can take place. The Project is located more than 5 miles from the nearest Urban Expansion District, which will minimize potential impacts on future urban growth. The Project will also allow for participating landowners to continue to use their agricultural land for activities such as farming and grazing, with a minimal loss of land that will be occupied by Project facilities. In return, participating landowners will receive income from Project leases. The Project will positively impact local economies by providing a diversified income stream for landowners, possible temporary construction jobs for local workers and suppliers, and tax benefits to the local governments.

The Mower County Zoning Ordinance Section 14-18.61 prohibits the placement of turbines in designated microwave beam paths and within a 1-mile (1.61 km) radius of the center point of the tower. Based on a review of the designated microwave beam paths, the Project will not infringe on the prohibited locations outlined in the Zoning Ordinance Section 14-18.61. In addition, the Project's Microwave Beam Path Study, performed by ComSearch in February 2021, found that two microwave beam paths cross the Project Site (see Table 8.6.1-1).

8.2.3 Mitigation Measures

The Project is compatible with the rural, agricultural character of Mower County and the goals and policies regarding urban growth set forth in the County's comprehensive plan and local zoning regulations. The Project Area is currently occupied by wind turbines surrounded by active agricultural land; therefore, no zoning or land use changes are proposed. The Project is compatible with existing land uses and Mower County's Comprehensive Plan. As a result, no mitigation is proposed beyond the typical construction restoration and other best practices discussed in Section 10.

8.3 CONSERVATION EASEMENTS AND CONTRACTS

8.3.1 Existing Resources

In Minnesota, there are multiple programs that allow landowners to sell or donate an easement to federal, state, or non-governmental organizations to meet conservation objectives. These programs include the Reinvest in Minnesota (RIM) Program, Conservation Reserve Enhancement Program (CREP), Wetlands Reserve Program (WRP), and the Agricultural Conservation Easement Program (ACEP). Similar programs, like the Conservation Reserve Program (CRP), involve contractual agreements between landowners and government agencies but do not include conservation easements. These programs have varying requirements, including length of time the land is protected, lease rates, and the types of resources that are protected.

RIM Reserve Program easements, administered by the Minnesota Board of Water and Soil Resources (BWSR), obtain conservation easements to permanently protect, restore and manage critical natural resources (BWSR, 2019). The RIM program allows conservation easements to remain under private ownership, but landowners are compensated for establishing native vegetation habitat plans, which are implemented in cooperation with county Soil and Water Conservation Districts (SWCD). There are no RIM lands located within the Project Site (Figure 3).

CRP and CREP are land conservation programs administered by Farm Service Agency (FSA). Farmers enrolled in the program are provided a yearly payment to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality (FSA, 2021a). CREP targets specific conservation concerns, and federal funds are supplemented with non-federal funds to address those concerns (FSA, 2021b). The contract period for both programs is typically 10 to 15 years. Based on correspondence with the Mower County SWCD, there are CRP lands present within the Project Site; however, no CREP lands are present (Mower County SWCD, 2021).

The Mower County offices of the Natural Resources Conservation Service (NRCS; Mower County NRCS, 2021) and FSA (Mower County FSA, 2021) indicated that information on CRP or CREP lands is confidential and should be obtained from the landowner. Rose Creek worked with landowners to avoid activities that would negatively affect CRP contracts, such as permanent access road or aboveground facility placement within CRP lands and avoided temporary impacts to the extent feasible.

The WRP is a voluntary easement program that allows landowners to protect and restore wetlands on their property. The U.S. Department of Agriculture (USDA) NRCS provides financial and technical assistance to support landowner's restoration efforts, with the goal of improving wetland function and habitats (NRCS, 2021a). The ACEP helps landowners protect and restore wetlands, grasslands, and working farms and ranches through various types of conservation easements (NRCS, 2021b). There are no WRP or ACEP easements within the Project Site (NRCS, 2021c).

A review of publicly available information did not identify any existing conservation easements within or directly adjacent to the Project Site. Some lands within the Project Site are subject to CRP contracts, and Rose Creek has worked with landowners to identify those CRP lands and has developed the Project design in a way that avoids CRP lands. Further, if any new

conservation easements or contracts are identified on participating parcels, Rose Creek will attempt to avoid these areas if possible.

8.3.2 Potential Impacts

Based on a review of currently available conservation easement data, the Project will not impact any conservation easements.

Information provided by the Mower County SWCD indicates that some lands within the Project Site do have CRP contracts. Rose Creek worked with participating landowners to identify CRP lands and will avoid Project impacts to those lands.

8.3.3 Mitigation Measures

Conservation easements have been avoided to the extent practicable. As such, impacts to conservation easements are not expected and there are no mitigative measures proposed.

The Project has worked with landowners to avoid CRP lands and therefore no mitigation measures are required.

8.4 SOUND

8.4.1 Existing Resources

Sound

According to Minnesota Statutes, section 116.06, subdivision 15, “noise” means “any sound not occurring in the natural environment, including, but not limited to, sounds emanating from aircraft and highways, and industrial, commercial, and residential sources.”

The Project Area is primarily agricultural and also includes county and township roads, residential farmsteads, and existing wind turbines. Existing sources of noise may include frequent agricultural activity, road use by freight truck and automobile traffic, farmstead operations, wind turbine operations, and intermittent aircraft overflights. There are 11 existing wind turbines within the Project Site, 15 turbines within 1,000 ft of the Project Boundary, and 21 turbines within 0.5 mile of the Project Boundary. The surrounding wind turbines are the primary source of ambient sound. Wind turbines within 10 miles of the Project Boundary are listed in Section 9.2.

According to the U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics National Transportation Noise Map, 24-hour LAeq road noise along 140th Street and 640th Avenue is estimated at between 45.0 to 49.9 dBA (USDOT, 2018). For the repower Project, a pre-construction sound level assessment was not conducted, which is consistent with guidance from MPUC and MDOC for repower projects.

8.4.2 Potential Impacts

Sound

The Project is subject to noise standards found in Minnesota Rules Chapter 7030, which is enforced by the MPCA. These noise standards describe the limiting levels of sound established for the preservation of public health and welfare. Minnesota’s primary noise limits are set by noise

area classifications (NAC) based on the land use activity at the location of the person that hears the sound as defined by Subpart 2 of Minnesota Rules, Part 7030.0050. The MPCA noise standards are broken out into daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00 AM) standards for each NAC. They are also based on the sound level in decibels (dBA) over ten percent (L10), or six minutes, and fifty percent (L50), or thirty minutes, of an hour. Table 8.4.2-1 summarizes the noise standards.

TABLE 8.4.2-1

Noise Standards

Noise Area Classification	Daytime		Nighttime	
	L50 (dBA)	L10 (dBA)	L50 (dBA)	L10 (dBA)
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Source: Minnesota R. 7030.0040 Subpart 2

The Project Area is considered a NAC-1 with land use activities falling under the category "household units" which includes farmhouses. The sound-sensitive receptors within the Project Area and within the vicinity of the turbine locations include rural farmstead residences. A total of 42 receptors, considered either inhabited or capable of habitation, were analyzed for Project-related sound level impacts. Habitation for existing structures was determined using public knowledge and roadside surveys. The Project was designed so that the maximum Project-only contribution to receptors does not exceed 47 dBA; therefore, the Project will not cause or significantly contribute to any potential exceedance of the 50 dBA noise standard.

8.4.2.1 Sound Modeling Results

Rose Creek contracted with KiloNewton to conduct a sound modeling study. The modeling was conducted using OpenWind, a modeling software the calculates sound levels at site-specific locations using sound sensitive receptors. Details of the modeling are included in the Sound Assessment Report available in Appendix C and results are shown on Figures 17a and 17b.

The assumptions and inputs for the sound analysis include:

- Temperature is set at 10 degrees C and relative humidity at 70%, which are optimal conditions for sound propagation;
- Air density for the site is set at 1.2 kg/m^3;
- The default ground porosity is set at 0.5 (on a range of 0=hard, 1=soft);
- All sound profiles for the turbines include a +2 dB to all octave bands and total sound power levels as a safety margin, which is recommended when using a ground porosity of 0.5;
- Gamesa does not provide octave bands for the G97, so, in consultation with DOC-EERA staff, KiloNewton interpolated octave bands using the octave bands from the other turbines provided at the appropriate hub height wind speeds and scaled so the total sound power level matched the G97 specifications. As a result, +3 dB was added as a safety margin to the G97; and

- Modeling was done using ISO9613-2 with octave band spreading.

A summary of the modeling results is provided in Table 8.4.2-2 and Table 8.4.2-3.

TABLE 8.4.2-2

Acoustic Modeling Results – Scenario 1

Modeled Total Sound dBA	Nearby Wind Farms (Including Project)		Project Only	
	Number of Receptors	Percent of Receptors	Number of Receptors	Percent of Receptors
0 to 35	1	2%	13	31%
35.1 to 40	13	31%	17	41%
40.1 to 45	18	43%	7	16%
45.1 to 47	2	5%	5	12%
47.1 to 50	8	19%	0	0%
50.1 or more	0	0%	0	0%

TABLE 8.4.2-3

Acoustic Modeling Results – Scenario 2

Modeled Total Sound dBA	Nearby Wind Farms (Including Project)		Project Only	
	Number of Receptors	Percent of Receptors	Number of Receptors	Percent of Receptors
0 to 35	1	2%	14	33%
35.1 to 40	15	36%	17	41%
40.1 to 45	14	32%	7	16%
45.1 to 47	6	15%	4	10%
47.1 to 50	6	15%	0	0%
50.1 or more	0	0%	0	0%

The modeling results of Scenario 1 indicate that the maximum value at any receptor due to the Project was found to be just below 47.0 dB(A); therefore, the Project is not projected to cause or contribute to any exceedance of the standard. No receptors were modeled to exceed a total sound of 50 dB(A).

The modeling results of Scenario 2 indicate the maximum value at any receptor due to the Project was 46.4 dB(A); therefore, the Project is not projected to cause or contribute to any exceedance of the standard. No receptors were modeled to exceed a total sound of 50 dB(A).

Project-specific sounds may also be produced temporarily during Project construction. Project construction may cause short-term, but unavoidable sound impacts. The sound levels resulting from construction activities vary significantly depending on several factors, such as the type and age of equipment, the specific equipment manufacturer and model, the operations being performed, and the overall condition of the equipment and exhaust system mufflers. Reasonable efforts will be made to minimize the impact of sound resulting from construction activities. Most Project construction work will occur during the daytime, although some construction may occur outside of typical business hours; construction that occurs outside of normal business hours is typically work that needs to be finished during the same time period as it is initiated (e.g., concrete pouring). All equipment will be maintained in good working order in accordance with manufacturer specifications.

Project construction and decommissioning activities that produce noise will comply with applicable state and local regulations.

8.4.3 Mitigation Measures

Sound

Because the Project was sited to comply with MPCA noise standards based on the acoustic modeling results and all turbines will be set back more than 1,500 ft from receptors, no mitigation is proposed at this time. Rose Creek will prepare a monitoring protocol for approval and conduct a post-construction sound level survey to:

- Determine total noise levels and LWECS contribution at different frequencies and at various distances from the turbines at various wind directions and speeds;
- Assess probable compliance with Minnesota noise standards;
- Confirm the validity of the noise modeling conducted prior to permit issuance or prior to construction; and
- Assess the modeling as a predictor of probable compliance with Minnesota noise standards.

The O&M staff will have full responsibility in ensuring the Project operates consistent with applicable permits, prudent industry practice, and equipment manufacturer recommendations. The Project will adhere to the MPUC process for documenting, investigating, and resolving complaints related to Project noise.

8.5 VISUAL IMPACTS

8.5.1 Existing Resources

The topography of the Project Area is relatively flat, with some areas of undulating, rolling relief. Based on MNDNR Light Detection and Ranging (LiDAR) data, elevations within the Project Site range from approximately 1,250 to 1,350 ft (381 to 412 m) above mean sea level (see Figure 8). The Project Site generally slopes downward to the west toward the Little Cedar River. The Project Site primarily consists of agricultural land that is mainly used for row crops. Generally, the landscape can be classified as rural open space and the structures in this area of Mower County consist mainly of residences and farm buildings (inhabited and uninhabited) scattered along rural county roads. The small rural communities of Adams and Taopi are just outside of the Project Boundary to the north and northeast, respectively.

Local vegetation within the Project Site is predominantly agricultural crop and pasture, which visually creates a low uniform cover. A mix of deciduous and coniferous trees planted for windbreaks typically surround farmsteads. Generally, these wooded areas are isolated groves or windrows established by the landowner/farmers to prevent wind erosion and shelter dwellings. Viewsheds in the area are generally long and open. Vertical elements such as HVTL structures, communication towers and existing wind turbines are visible within the Project Area. Additionally, aboveground electrical distribution lines parallel many roads within the Project Area.

Refer to Section 9.2 for existing wind farms within 10 miles (16.09 km) of the Rose Creek Wind Project and Section 8.4 for a discussion on turbine lighting.

Public Resources

Public resources are located within the Project Area. There are no USFWS national parks or refuges, USFWS Waterfowl Production Areas, Minnesota state parks, MNDNR aquatic management areas, MNDNR wildlife management areas (WMA), or other MNDNR-managed lands within the Project Site. However, there are several public recreation and wildlife areas within 3 miles (4.83 km) of the Project. One waterway listed on the state PWI, a tributary to Little Cedar River, is located in the north central portion of the Project Site. (Figure 11, MNDNR, 2020a).

Refer to Section 8.8.1 for Public Resources within 10 miles (16.09 km) of the Rose Creek Wind Project and refer to Section 8.17.1 for Public Waters located within the Rose Creek Wind Project.

Private Lands and Homes

Private lands and homes in this area of Mower County include residential farmsteads along rural county and township roads. A survey was completed in the fall of 2020 to estimate the number and location of occupied residences within 0.25 mi of the Project Boundary. Based on this survey, which involved viewing structures from public rights-of-way and making a visual determination of occupancy, 23 occupied residences are estimated to be within the Project Site as shown on Figure 4. The Project will be primarily located on private lands, with executed land lease agreements.

Potential visual impacts to architectural resources listed in the National Register of Historic Places (NRHP) are addressed in Section 8.7.2.

Turbine and Facility Lighting

The existing Rose Wind project is located within the Project Site and consists of 11 turbines with red-blinking lights. These will be decommissioned prior to the commercial operation of the proposed Project. There are 11 windfarms and 385 wind turbines (including the 11 existing Rose Wind turbines) within 10 miles of the Project Boundary of various heights, rotor diameters, and lighting mechanisms (see Section 9.2 for additional details). MET towers associated with these wind facilities may be present on the landscape with individual lighting systems.

Shadow Flicker

Shadow flicker is an intermittent change in light intensity from the interaction of an operating wind turbine and the sun. The result may be repeated changes in brightness as wind turbine blades rotate. Shadow flicker is limited to time periods when the wind turbine is operating and the sun is shining. In addition, shadow flicker is limited to the times of day when a window of the participating or non-participating residence is in the shadow of the wind turbine.

Shadow flicker is currently present in the Project Area due to operating turbines, including Adams Wind, Rose Wind, and other nearby wind farms described in Section 9.2. No complaints are known to have been recorded related to shadow flicker from existing turbines.

8.5.2 Potential Impacts

Public Resources

While the installation of the proposed wind turbines may impact the visual surroundings of the wind facility and could visually impact public resources and individuals' visual experiences, the degree of visual impact will vary based on personal preferences. The Project will not be introducing a new feature type to the landscape, and it will not create a new impact on public resources because many wind turbines are currently operating in the Project Area. The Project meets MPUC setback requirements, and public resources are not present within the Project Site, with the exception of one public water that will not be impacted. In addition, the Applicant also employed the following measures during Project planning and design:

- Use of uniformly colored turbines;
- Avoidance of turbine placement in sensitive areas such as Wildlife Management Areas, Waterfowl Protection Areas, public parks, WMAs, and scientific and natural areas (SNA);
- Turbine lighting that meets the minimum requirements of FAA regulations for wind turbine projects (see Section 8.4 for more discussion on turbine lighting);
- Underground collection lines to minimize aboveground structures;
- Use of existing roads for construction and maintenance, where possible, to minimize construction of new roads; and
- Restoration of temporarily disturbed lands to their former use (e.g., cropland) or reseeded with regionally specific native seed mixes, as appropriate.

During operation, wind turbines may impact the visual surroundings of the Project Area; however, the degree of visual impacts has been minimized by increasing setback distances from public roads and residences and by reducing the number of turbines present on the landscape. Although the proposed Rose Creek turbines will be larger than the existing Rose Wind turbines, the proposed Project will have four or five fewer turbines than Rose Wind. Therefore, the Applicant anticipates an overall reduction in visual impacts to public resources.

Private Lands and Homes

See above subsection on Public Resources for measures that the Applicant implemented during Project planning and design to minimize visual impacts from the Project. Residents of the area are expected to have a higher sensitivity to the potential aesthetic impacts of the Project than temporary observers. However, given that the proposed Project will have fewer turbines than the existing Rose Wind Project, the Applicant anticipates a decrease in visual impacts to private lands and homes.

Turbine and Facility Lighting

The Project will not introduce any new features to the landscape because wind turbines are already present within the Project Area. In addition, the number of turbines in the immediate vicinity will be reduced by four or five, after the removal of the 11 Rose Wind turbines and

depending on the Rose Creek layout scenario. In addition, and no MET towers will be constructed for Rose Creek. Therefore, the overall impact from turbine lighting will be less than current conditions.

Rose Creek is not considering the installation of an Aircraft Detection Lighting System (ADLS) at this time because: the Project is small with only 6 or 7 turbines; the existing Rose Wind project does not use ADLS lighting; the Project is within an area that has a significant number of existing turbines, many of which do not have ADLS lighting systems; and finally, based on preliminary quotes provided by ADLS vendors, installing ADLS lighting at the Rose Creek Wind Project would be cost prohibitive. The costs for purchase and installation of an ADLS system would amount to approximately 2% of the total development costs of the Project, which does not include the lifetime costs to operate and maintain the ADLS system.

The FAA requires obstruction lighting or marking of structures over 200 ft (60.96 m) above ground level because they have the potential to obstruct air navigation. Rose Creek will seek FAA approval of a lighting plan that is compliant with FAA standards.

Shadow Flicker

The Applicant designed the Project to minimize potential impacts from shadow flicker on participating and non-participating residences. These design considerations include turbine setbacks of at least 1,500 ft (456 m) from participating and non-participating residences and fewer turbines than the existing Rose Wind Project, which will result in reduced shadow flicker.

Shadow Flicker Analysis

KiloNewton conducted a shadow flicker analysis to assess the shadow flicker impacts on nearby receptors for the Project. Details of the study are included in Appendix D.

Key assumption inputs included:

- Shadow flicker is modeled with an observer eye level of 1.5 m above ground level;
- Line of sight is checked every 5 m;
- Shadow flicker is ignored when the sun is below 3 degrees on the far horizon;
- Shadow flicker is checked to 2,000 m from each respective turbine;
- The model takes into account calculated monthly probability of sunshine hours derived from the National Renewable Energy Laboratory's SolarAnywhere dataset;
- Turbine availability, orientation, and operation scheduling is not considered for this analysis; and
- No other existing projects are included in the analysis.

Tables 8.5.2-1 and 8.5.2-2 outline the results of the shadow flicker distribution from the modeling study for Scenarios 1 and 2, respectively. Figures 18a and 18b show the isopleths of potential shadow flicker in and near the Project Area. More detail is in Appendix D.

TABLE 8.5.2-1

Distribution of Occupied Structures and Modeled Shadow Flicker Results – Scenario 1

Modeled Shadow Flicker	Total Number of Receptors	Percent of Receptors
0	26	62%
0 to 10	15	36%
10.1 to 20	1	2%
20.1 to 30	0	0%
30.1 or More	0	0%

TABLE 8.5.2-2

Distribution of Occupied Structures and Modeled Shadow Flicker Results – Scenario 2

Modeled Shadow Flicker	Total Number of Receptors	Percent of Receptors
0	22	53%
0 to 10	18	43%
10.1 to 20	2	4%
20.1 to 30	0	0%
30.1 or More	0	0%

Under both Scenario 1 and Scenario 2, no receptors in the vicinity of the Project were found to potentially exceed 30 hours of shadow flicker per year.

8.5.3 Mitigation Measures

Public Resources

No mitigation measures are proposed as the Project is not expected to alter the visual impact on public resources.

Private Lands and Homes

No mitigation measures are proposed as the Project is not expected to alter the visual impact private lands and homes.

Turbine and Facility Lighting

Rose Creek will be illuminated as necessary to meet the minimum FAA requirements of obstruction lighting. No mitigation measures are proposed because the Project will meet FAA lighting requirements and will constitute a reduction of total turbine lighting impacts from the existing conditions.

Shadow Flicker

No mitigation measures are proposed as the Project is not expected to have significant impacts in the Project Area related to shadow flicker.

Complaints from remaining impacts from shadow flicker will be managed on a site-specific basis. Measures may include the following:

- Communicate with complainants to identify and understand specific aspects of the complaint;

- Research the basis for the complaint; and
- Offer the homeowner options for mitigation, such as vegetation plantings, blinds, awnings, or shades.

8.6 PUBLIC SERVICES AND INFRASTRUCTURE

The Project is located in rural southern Minnesota immediately north of the Iowa border. Rural residences in the Project Area are served by a system of existing roads and utilities that provide access, water, electricity, telephone, and other communication services to rural residences and farmsteads. Rural residences and farmsteads are likely to use private septic systems and water wells for household needs. The small cities of Adams and Taopi, Minnesota are located north of and adjacent to and 1.5 miles northeast, respectively, of the Project Area.

8.6.1 Existing Resources

Roads and Railroads

Existing road infrastructure within the Project Site consists of state, county, and township roads that typically follow section lines, farmstead driveways, and farming access roads. Various county and township roads provide access to the Project Site.

No railroads were identified within the Project Site.

Communication Systems

The below subsection describes communication systems in the Project Area, including microwave, radio, fixed land-mobile stations, and television (TV).

Microwave

Microwave bands that may be affected by the installation of wind turbine facilities operate over a wide frequency range (900 MHz – 23 GHz). Licensed microwave networks are the telecommunication backbone of the country, providing long-distance and local telephone service, backhaul for cellular and personal communication service, data interconnects for mainframe computers and the Internet, network controls for utilities and railroads, and various video services. This analysis focuses on the potential impact of wind turbines on licensed, proposed and applied non-federal government microwave systems. Based on a review and obstruction analysis conducted of all non-government licensed, proposed and applied paths from 0.9 - 23 GHz., 5 microwave paths are found in the Project Area (see Figure 2 in the Microwave Study in Appendix E). One of these microwave paths narrowly intersects the Project Site (Table 8.6.1-1 and Figure 16), while no microwave paths cross any of the proposed turbine locations. The Rose Creek Wind Microwave Study is in Appendix E and microwave beam paths identified by Mower County are discussed in detail in Section 8.2.

TABLE 8.6.1-1

Summary of Microwave Paths that Intersect the Microwave Study Area

ID	Status	Callsign 1	Callsign 2	Band (GHz)	Path Length (km)	Intersect with Project Site
1	Licensed	WEG335	WEG334	6.1	29.74	No
2	Licensed	WEG336	WEG335	6.1	48.42	Yes
3	Licensed	WPRR543	WPRR544	6.1	30.23	No

TABLE 8.6.1-1

Summary of Microwave Paths that Intersect the Microwave Study Area

ID	Status	Callsign 1	Callsign 2	Band (GHz)	Path Length (km)	Intersect with Project Site
4	Licensed	WPRR543	WQKD951	6.1	19.55	No
5	Licensed	WQRX918	WQKD951	6.1	29.57	No

Radio

No AM or FM radio towers were documented within the communication systems study area. Two active AM towers were identified within 18.6 miles (29.93 km) of the Project with call signs KAUS and KQAQ. Ten FM stations were identified within 18.6 miles (29.93 km) of the Project including KFNL-FM, KVCS, KROC-FM, KYBA, KJCY, K277AD, K280EF, KMSK, K232FY, KSMA-FM. Nine of these stations are currently licensed and operating, three of which are translator stations that broadcast with limited range (K277AD, K280EF, and K232FY). The Rose Creek Wind AM and FM Radio Report is in Appendix E.

Fixed Land-Mobile Stations

Fixed land-mobile stations may be used in the Project Area for police, fire, emergency medical services, emergency management, hospitals, public works, transportation and other state, county, and municipal agencies, among other reasons. Fixed land mobile-stations are typically unaffected by wind projects because their systems have multiple transmitters that provide redundancies such that their signals can be broadcasted around wind turbines. Six site-based licenses were identified in the communication systems study area. The Rose Creek Wind Land Mobile & Emergency Services Report is in Appendix E.

Television

Off-air TV stations broadcast signals from terrestrially based facilities directly to TV receivers. TV stations at a distance of 150 km (93.21 miles) or less are the most likely to provide off-air coverage to the Project Area and neighboring communities. A total of 93 database records are present for stations within approximately 150 km (93.21 miles) of the proposed turbines. Of these stations, only 44 stations are currently licensed and operating, 25 of which are low-power stations or translators. Translator stations are low-power stations that receive signals from distant broadcasters and retransmit the signal to a local audience. These stations serve local audiences and have limited range, which is a function of their transmit power and the height of their transmit antenna. Based on a contour analysis of the licensed stations within 150 km (93.21 miles) of the Project, 11 of the full-power digital TV stations and 2 low-power TV digital stations may have their reception disrupted in and around the Project (see Table 8.6.1-2). The Rose Creek Wind Off-Air TV Analysis is in Appendix E.

TABLE 8.6.1-2

Licensed Off-Air TV Stations Subject to Disruption

ID	Call Sign	Service [a]	Channel	Transmit ERP (kW) [b]	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Area of Interest (km)
1	KYIN	DTV	18	533.0	43.475556	-92.708333	2.76
2	KIMT	DTV	24	472.0	43.475556	-92.708333	2.76
4	KSMQ-TV	DTV	20	319.2	43.642778	-92.526667	11.42
5	KXLT-TV	DTV	26	108.0	43.642778	-92.526667	11.42
6	KAAL	DTV	36	620.0	43.642778	-92.526667	11.42
8	KTTC	DTV	10	43.1	43.570833	-92.427222	12.35

TABLE 8.6.1-2

Licensed Off-Air TV Stations Subject to Disruption

ID	Call Sign	Service [a]	Channel	Transmit ERP (kW) [b]	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Area of Interest (km)
9	K27OW-D	LPT	27	5.62	43.672556	-92.830306	14.19
26	K25NK-D	LPD	25	15.0	44.041111	-92.340556	57.89
58	WLAX	DTV	33	1000.0	43.804444	-91.372167	101.26
59	WHLA-TV	DTV	15	400.0	43.805083	-91.368083	101.59
60	WXOW	DTV	28	251.0	43.806389	-91.367500	101.68
73	WKBT-DT	DTV	8	25.7	44.091111	-91.338056	116.74
79	KWWL	DTV	7	49.0	42.400556	-91.843611	135.94

[a] DTV: Full Service TV; LPT: Digital TV Translator; LPD: Low Power Digital TV.
[b] ERP: Transmit Effective Radiated Power.

Cell Towers and Broadband Interference

Rose Creek Wind, LLC identified one cellular site recorded with the Federal Communications Commission (FCC) that is owned by Verizon and located 7.55 miles (12.2 km) east of the Project Boundary. The Rose Creek Wind Mobile Phone Carrier Report is in Appendix E. Broadband is provided by 6 providers within Mower County covering 90.75% of the county; providers include CenturyLink, Frontier Communications, Home Telcom, AcenTek, KMTelecom, and Jaguar Communications (Best Neighborhood, undated).

Pipelines and Electric Transmission Lines

No pipelines were identified within the Project Site in publicly available databases or mapping (USDOT, 2020). For the purposes of the application, the Applicant conducted a detailed desktop review to identify other potential pipelines, easements, and buried infrastructure within the anticipated area of construction disturbance. Prior to commencing construction, the Applicant's construction contractor will complete One-Calls to locate utilities within the construction footprint.

According to Minnesota Geospatial Information three electric transmission lines 69 kV and greater are located within the Project Site. In addition, two other transmission lines under 69 kV are located within the Project Site (Minnesota Geospatial Commons, 2016).

8.6.2 Potential Impacts

Roads and Railroads

Temporary impacts are expected to public roads during construction as materials, personnel, and equipment will be brought in via existing highways and roads. Construction traffic will use the existing county and state roadway system to access the Project and deliver construction materials and personnel. Changes to road radii for turbine and blade delivery may be required; however, they will be returned to pre-construction conditions. Exact routes have yet to be determined in coordination with state and local jurisdictions as this will occur closer to construction. Interstate 35 and Interstate 90 are the main access routes into the Project Area and would likely be used as corridors to bring materials and equipment to the Project Site. Construction activities will increase the amount of traffic using local roadways, but such use is not anticipated to result in adverse traffic impacts.

During the construction phase, several types of light, medium, and heavy-duty construction vehicles will travel to and from the Project Site, as well as private vehicles used by construction personnel. The Applicant estimates that there will be 3 large truck trips per day, with a peak of approximately 75 large truck trips for the duration of the Project. In addition, there will be an estimated 25 small-vehicle (pickups and automobiles) trips per day in the area in a twelve (12) hour workday during peak construction periods. The functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day. However, some minor, short-term traffic delays within and near the Project Site may occur during turbine and equipment delivery and construction activities.

After construction is complete, operation activities for the new (up to 7) turbines will be similar to the existing (11) turbines. There will be no new operational activities and traffic in the Project Area will not increase.

Communication Systems

Microwave

Fresnel Zones and Consultation Zones were calculated for the one microwave path that intersects the Project Site. The Fresnel Zone is the narrow area of the signal swath, and the Consultation Zone is the area directly in front of each microwave antenna measuring 1 km (0.62 miles) along the main beam of the antenna and 24 ft (7.32 m) wide. Based on the proposed turbine locations, there are no potential obstructions between the wind turbine locations and the Fresnel Zones or Consultation Zones of the incumbent microwave paths in the Project Area. Thus, no impacts on microwave paths are anticipated due to the Project.

Radio

The exclusion distance for AM broadcast stations varies as a function of the antenna type and broadcast frequency. For directional antennas, the exclusion distance is calculated by taking the lesser of 10 wavelengths or 3 km (1.86 miles). For non-directional antennas, the exclusion distance is simply equal to 1 wavelength. Potential problems with AM broadcast coverage are only anticipated when AM broadcast stations are located within their respective exclusion distance limit from wind turbine towers. Station KAUS is the nearest AM station to the Project Site at 21.57 km (13.4 miles) away. As there were no stations found within 3 km (1.86 miles) of the Project, which is the maximum possible exclusion distance based on a directional AM antenna broadcasting at 1000 KHz or less, the Project should not impact the coverage of local AM stations.

The coverage of FM stations is generally not sensitive to interference due to wind turbines, especially when large objects (e.g., wind turbines) are located in the far field region of the radiating antenna to avoid the risk of distorting its radiation pattern. Station KFNL-FM is the nearest FM station to the Project Site at 9.9 km (6.15 miles) away. At this distance there should be adequate separation to avoid radiation pattern distortion.

Fixed Land-Mobile Stations

The first responder, industrial/business land-mobile sites, area-wide public safety, and commercial E-911 communications are typically unaffected by the presence of wind turbines, and no significant impacts are anticipated to these services in the Project Area. Although each of these services operates in different frequency ranges and provides different types of service including voice, video and data applications, there is commonality among these different networks with

regard to the impact of wind turbines on their service. Each of these networks is designed to operate reliably in a non-line-of-sight environment. Many land-mobile systems are designed with multiple base transmitter stations covering a large geographic area with overlap between adjacent transmitter sites in order to provide handoff between cells. Therefore, any signal blockage caused by the wind turbines does not materially degrade the reception because the end user is likely receiving signals from multiple transmitter locations. Additionally, the frequencies of operation for these services have characteristics that allow the signal to propagate through wind turbines. As a result, very little, if any, change in their coverage should occur when the wind turbines are installed.

When planning the wind energy turbine locations in the area of interest, a conservative approach would dictate not locating any turbines within 77.5 m (254.27 ft) of a land mobile fixed-base station to avoid any possible impact to the communications services provided by these stations. This distance is based on FCC interference emissions from electrical devices in the land-mobile frequency bands. As long as the turbines are located more than 77.5 m (254.27 ft) from the land-mobile stations, they will meet the setback distance criteria for FCC interference emissions in the land mobile bands. There is 1 fixed land-mobile station located within the Project Area and 2 located within at least 77.5 m (254.27 ft) of the Project Site. All fixed land-mobile stations are more than 77.5 m (254.27 ft) from all proposed turbine locations. Similarly, no interference with land-mobile stations is anticipated from Project collector lines.

Television

Based on an Off-Air TV Analysis that was completed in February 2021, a total of 93 database records were identified for TV stations within approximately 150 km (93.21 miles) of the Project (see report in Appendix E). Based on the analysis, it was determined that 11 of the full-power digital TV stations and 2 low-power digital TV stations may have their reception interrupted (refer to Table 8.6.1-2), however, the areas primarily affected would be within 10 km (6.21 miles) of the turbines that have clear line-of-sight to a proposed wind turbine but not to the respective station. Residences may have degraded reception from these stations due to multipath interference caused by signal scattering because TV signals are reflected by the rotating wind turbine blades and masts. However, modern digital TV receivers have undergone significant improvements to mitigate the effects of signal scattering. When used in combination with a directional antenna, it is even less likely that signal scattering from wind farms will cause interference to digital TV reception. Nevertheless, signal scattering could still impact certain areas currently served by the TV stations in Table 8.6.1-2, especially those that would have line-of-sight to at least one wind turbine but not to the station antennae.

Cell Towers and Broadband Interference

The telephone communications in the mobile phone carrier bands are typically unaffected by the presence of the wind turbines and no significant harmful effect to mobile phone services are anticipated in the Project Area. Mobile phone systems are designed with multiple base transmitter stations covering a specific area. Since mobile telephone signals are designed with overlap between adjacent base transmitter sites in order to provide handoff between cells, any signal blockage caused by the wind turbines does not materially degrade the reception because the end user may be receiving from multiple transmitter locations. For example, if a particular turbine attenuates the signal reception into a mobile phone, the phone may receive an alternate signal from a different transmit location, resulting in no disruption in service. The Project is also not expected to impact broadband service.

Pipelines and Electric Transmission Lines

The Project will be constructed to avoid impacts to pipelines and other underground infrastructure as well as overhead transmission lines. Although not a requirement under Minnesota rules, Project turbines will be set back at least 1.1 times total height from all electric transmission lines as an impact avoidance measure.

8.6.3 Mitigation Measures

Roads and Railroads

Prior to construction, Rose Creek Wind will coordinate with MnDOT and the Mower County Public Works Department to ensure all relevant permits are obtained, delivery plans are communicated, traffic management plans are implemented where necessary, and weight limits are not exceeded. Additionally, large trucks will have a maximum speed limit of 25 miles per hour within project construction areas. Rose Creek will negotiate road use agreements with applicable roadway authorities to ensure that impacted or damaged roadways will be restored to their original condition or better. Temporary impacts to the landscape associated with temporary access road approaches, the crane walks, and other temporary activities will be restored to previous agricultural conditions or otherwise reseeded with seed mixes appropriate for the region. Traffic is not expected to increase during the operations phase of the Project.

No other mitigation measures are proposed as the Project is not expected to have permanent impact roads and railroads.

Communication Systems

Microwave

Rose Creek Wind's analysis shows that there are no potential obstructions between the wind turbine locations and the Fresnel Zones or Consultation Zones of the one incumbent microwave path in the Project Area. Thus, no mitigation related to microwave paths is proposed.

Radio

No impacts to licensed and operational AM or FM broadcast stations was identified, and mitigation is not anticipated.

Fixed Land-Mobile Stations

No impacts to fixed land-mobile stations are anticipated, and mitigation is not anticipated.

Television

In the unlikely event that interference is observed in any of the TV service areas, the interference may be mitigated through use of a high-gain directional antenna placed outside and oriented towards the signal origin. Both cable service and direct broadcast satellite service will be unaffected by the presence of the wind turbine facility. If TV interference is reported, Rose Creek will log the report, determine if the interference is related to the Project, and work with the landowner and local communication technician to determine if a high-grain directional antenna

could be installed. Alternatively, Rose Creek may offer monetary compensation comparable to the direct cost of the antenna.

Cell Towers and Broadband Interference

No impacts to cell towers or broadband interference are anticipated, and mitigation is not anticipated.

Pipelines and Electric Transmission Lines

No impacts to pipeline or transmission lines are anticipated and mitigation is not anticipated.

8.7 CULTURAL AND ARCHAEOLOGICAL RESOURCES

Consultation was initiated with the SHPO and Office of the State Archaeologist (OSA) in letters dated March 9, 2021 (see Appendix A). The letters introduced the Project, provided the results of a preliminary file search for the Project Area and requested an initial comment response on the Project. In a response received April 5, 2021, the Minnesota SHPO recommended a Phase Ia literature search be completed for the Project, to be followed by Phase I archaeological surveys as appropriate, and assessments of direct and indirect impacts to cultural resources (see Appendix B). In a May 12, 2021 response, the OSA concurred that a literature review and archaeological assessment should be completed, and also recommended avoidance of previously recorded burial site 21MW0002 and survey and evaluation of alpha site 21Mwe, should the site be impacted.

To address the Minnesota Department of Commerce (MNDOC) policy on Minnesota Executive Order 19-24, an introduction to the Project and request for coordination with potentially interested tribal nations was submitted through the MNDOC Tribal Liaison on April 15, 2021. The initial request was submitted by the MNDOC via email on April 22, 2021, to the Tribal Historic Preservation Officers (THPO) for the 11 federally recognized Tribes that share a common geography with the State of Minnesota. For THPOs that did not respond to the initial request, follow-up phone calls and emails were conducted in May and June 2021. To date, three Tribes (Lower Sioux Indian Community, Upper Sioux Community, and Shakopee Mdewakanton Sioux Community) have expressed interest in receiving further information on the Project. Rose Creek continues to provide regular Project updates to these three interested Tribes.

At the time of the initial communications between Rose Creek and the Tribes, the Project's preliminary boundary was larger than the current proposed boundary and was near previously recorded burial site 21MW0002. The preliminary boundary also included alpha site 21Mwe. Responses received from the Lower Sioux Indian Community and the Shakopee Mdewakanton Sioux Community both indicated concern over the potential for the Project to negatively impact those known sites. Subsequently, Rose Creek revised the Project Boundary so that both sites are outside of the Project and will be completely avoided by Project activities.

A Phase Ia literature search was completed for the Project in August 2021 (see Appendix B). Based on the results of the literature search, a Phase I archaeological survey and an Architecture-History Effects Analysis were completed in November, 2021. On August 18, 2021, information was provided to Lower Sioux Indian Community, Upper Sioux Community, and Shakopee Mdewakanton Sioux Community on the results of the literature search and the plan to conduct a Phase I archaeological survey. Coordination will continue with SHPO, OSA, and Tribes

expressing an interest in the Project through all stages of Project development regarding potential impacts to cultural and archaeological resources and necessary mitigative measures.

The Phase I archaeological survey was completed in Project areas where access had been granted by Project participants. Surveys identified no previously unidentified archaeological resources. Additional surveys for new or previously unsurveyed Project areas will be performed in spring 2022. Reports detailing the results of the archaeological survey and Architecture-History Effects Analysis are being prepared and will be submitted to the MPUC in February 2022, with supplemental reports expected in June 2022.

8.7.1 Existing Resources

Existing resources were identified through the completion of a Phase Ia literature search. The literature search focused on previously recorded archaeological sites, previously inventoried architectural properties, and historic properties eligible for or listed in the NRHP within the Project Literature Search Study Area, defined as the Project Boundary plus a 1-mile (1.61 km) buffer. The literature search consisted of a database search request submitted to SHPO and a review of information available through the OSA Portal (OSA, 2020). Due to the State office closures, in-person visits to SHPO and OSA were not conducted. For context, and because the Literature Search Study Area extends into Mitchell County, Iowa, information was also reviewed on previously recorded archaeological sites and architectural properties through the Iowa Office of the State Archaeologist online database (I-Sites). The literature search identified no recorded NRHP-eligible or listed archaeological sites or architectural properties within the Literature Search Study Area in Iowa; therefore, only the results of the Minnesota literature search are discussed in this section.

Previous Archaeological Surveys

Due to the Minnesota Stay Safe office closures at the SHPO and OSA, the review of previous archaeological surveys was limited to documents referenced in online sources. The literature search identified one survey within the Study Area (see Table 8.7.1-1). The survey was conducted on behalf of a solar farm project and is adjacent to the Project Site (Grohnke et al., 2020).

TABLE 8.7.1-1

Previous Surveys within the Literature Search Study Area

Report Number	Report Title	Author	Year
N/A	Phase I Archaeological Survey, Louise Solar Project, Mower County, Minnesota	Grohnke, et al.	2020

Previously Recorded Archaeological Sites

There are three previously recorded archaeological sites within the Literature Search Study Area (Table 8.7.1-2). Site 21Mwe is a Precontact lithic scatter alpha site. As an alpha site, the condition and location of the site has not been verified by a cultural resources professional. Site 21MW0002 is a Precontact earthwork/burial mound; the site was reported in 1939 and the current condition is unknown. Site 21MW0046 is a Precontact lithic scatter. The three sites are unevaluated for the NRHP. No previously recorded archaeological sites are within the Project Site.

TABLE 8.7.1-2

Previously Recorded Archaeological Sites in the Literature Search Study Area

Site Number	Type	NRHP Status	Intersects Project Boundary
21Mwe	Precontact lithic scatter	Unevaluated	No
21MW0002	Precontact earthwork, burial mound	Unevaluated	No
21MW0046	Precontact lithic scatter	Unevaluated	No

Previously Recorded Architectural Properties

There are 20 previously recorded architectural properties within the Literature Search Study Area (Table 8.7.1-3). One property, the First National Bank of Adams (MW-ADA-001) is listed in the NRHP. The First National Bank of Adams is approximately 0.5-mile (0.81 km) north of the Project Boundary. The remaining 27 properties are unevaluated. None of the architectural properties are within the Project Site.

TABLE 8.7.1-3

Previously Recorded Architectural Properties in the Literature Search Study Area

Inventory Number	Property Name	NRHP Status	Intersects Project Site
MW-ADA-001	First National Bank of Adams	Listed	No
MW-ADA-002	Adams Water Works	Unevaluated	No
MW-ADA-003	Blacksmith shop	Unevaluated	No
MW-ADA-004	Krebsbach Building	Unevaluated	No
MW-ADA-005	Krebsbach Block	Unevaluated	No
MW-ADA-006	A. Torgerson Block	Unevaluated	No
MW-ADA-007	Tillman Chevy Dealership	Unevaluated	No
MW-ADA-008	House	Unevaluated	No
MW-ADA-009	House	Unevaluated	No
MW-ADA-010	Adams City Hall	Unevaluated	No
MW-ADA-011	Sacred Heart Catholic Church	Unevaluated	No
MW-ADA-012	Nordine Torgerson House	Unevaluated	No
MW-ADA-013	Andrew Torgerson House	Unevaluated	No
MW-ADA-014	Bridge No. 2553	Unevaluated	No
MW-ADA-015	Bridge 89215	Unevaluated	No
MW-ADM-004	Afton Olson Barn	Unevaluated	No
MW-ADM-007	Bridge No. 6470	Unevaluated	No
MW-LOD-003	Bridge L5023	Unevaluated	No
MW-LOD-004	Bridge L5045	Unevaluated	No
XX-ROD-022	Trunk Hwy 56	Unevaluated	No

8.7.2 Potential Impacts

Direct impacts to recorded cultural resources may occur during Project construction if resources are within the construction footprint. There may be unrecorded archaeological sites within the Project Site, and cultural materials could be encountered during construction. In addition, construction and/or removal of aboveground structures could impact the viewshed of cultural resources near the Project.

Direct impacts to archaeological sites, architectural properties, and culturally sensitive areas will be avoided during all phases of the Project to the extent practicable. To identify archaeological sites that could be impacted, Phase I archaeological surveys for the Project were performed in November 2021 in areas where survey permission had been granted. The Phase I surveys

focused on areas of anticipated ground disturbance. Phase I survey protocols followed guidelines described in the State Archaeologist's Manual for Archaeological Projects in Minnesota (Anfinson, 2011) and the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (National Park Service [NPS], 1983). No archaeological resources were identified during the field surveys. If changes to the Project design require additional future surveys, and if archaeological resources are identified during future Phase I archaeological surveys, the significance of the resources will be assessed using the criteria for NRHP eligibility. Attempts will be made to avoid impacts using Project redesign or micro siting; however, if significant resources are identified during the Phase I surveys and cannot be avoided, further investigation and/or mitigation will be completed in coordination with SHPO, OSA, and interested THPOs. Coordination will be conducted with THPOs to avoid direct and indirect impacts to culturally sensitive areas.

Potential indirect impacts to properties listed in the NRHP or State Register of Historic Places will be reviewed at the same time as the Phase I surveys. There is one NRHP-listed property (First National Bank of Adams) within approximately 0.5 mile of the Project Boundary. Indirect impacts will be assessed pursuant to the Minnesota Historic Sites Act (Minnesota Statute 138.661-138.669). If potential indirect impacts are identified during the review, further investigation and/or mitigation will be completed in coordination with SHPO.

8.7.3 Mitigation Measures

An Unanticipated Discoveries Plan (UDP) will be developed for the Project. The UDP will outline procedures to be followed if Project construction activities encounter any previously undocumented archaeological resources or human remains, or if Project activities inadvertently impact previously recorded resources in an unanticipated manner. The UDP will be developed in coordination with SHPO, OSA, and consulting tribes and will follow applicable State laws, including Minnesota Statute 307.08 which protects human burial grounds regardless of land ownership. The UDP will be e-filed at least 14 days prior to the pre-construction meeting.

8.8 RECREATION

8.8.1 Existing Resources

Mower County (MN) and Mitchell County (IA) provide a number of outdoor recreational opportunities to the public. Recreational lands can be publicly or privately owned and managed and include areas to bike, hike, fish, hunt, camp, and observe nature. A review of publicly available data (provided by Mower County, 2021; MNDNR, 2021b; and Iowa Department of Natural Resources, 2021) was completed to identify recreational resources within 10 miles (16.09 km) of the Project (see Figure 3: Public Land Ownership and Recreation). The Wapsipinicon River is designated by the Iowa Department of Natural Resources as a canoe route and crosses into the southern portion of the Project Site. This section of the waterbody is not legally protected nor is it a viable water trail. A desktop review of the waterbody identified it as more of an agricultural ditch.

Wildlife Management Areas

There are 12 WMAs within 10 miles (16.09 km) of the Project in Iowa and Minnesota. Minnesota WMAs are owned and managed by the State and WMAs in Iowa are managed by the state or county. WMAs were established to help manage and protect public lands designated for hunting, fishing, and wildlife production. The nearest WMA to the Project, Wapsi River WMA, is located

2.7 miles (4.37 km) southeast of the Project, in Iowa. Table 8.8.1-1 includes the nearest WMAs and the distance to the Project.

Table 8.8.1-1

Wildlife Management Areas within 10 miles (16.09 km) of the Project Boundary

WMA Name	Distance from Project (miles)	Location	WMA Area (acres)	State
Wapsi River WMA	2.7 (4.37 km)	SE	113.6	Iowa
Rustic Retreat WMA	3.8 (6.09 km)	NE	16.2	Minnesota
Pinicon Alders WMA	4.0 (6.51 km)	SE	316.9	Iowa
Rose WMA	5.0 (8.05 km)	NW	50.6	Minnesota
Huffman WMA	6.6 (10.56 km)	SE	35.6	Iowa
Lena Larson WMA	6.6 (10.56 km)	W	171.8	Minnesota
Gerbig's Woods WMA	6.7 (10.74 km)	SE	21.7	Iowa
Schwerin Creek WMA	7.0 (11.25 km)	N	37.2	Minnesota
Cartney WMA	7.2 (11.64 km)	NE	480.3	Minnesota
Schottler WMA	9.4 (15.05 km)	NW	166.3	Minnesota
Burr Oak Wetland WMA	9.7 (15.66 km)	SW	39.7	Iowa
Kleckner WMA	9.9 (15.90 km)	W	54.5	Iowa

Walk-In Access

The MNDNR Walk-in Access (WIA) Program offers the public an opportunity to hunt on private land. These sites are only open during the legal hunting season. There is one WIA site, #593, located 3 miles (4.83 km) directly north of the Project.

Parks and Public Trails

There are no state or county parks/trails located within the Project, however, Shooting Star State Trail runs adjacent to the northern Project Boundary. Shooting Star State Trail is a 29-mile-long (46.67 km) paved walking and biking trail that starts in the City of LeRoy and runs northwest through Lake Louise State Park and through the communities of Taopi, Adams, and Rose Creek. The trail offers biking, hiking, in-line skating, and scenic views of native wildflowers and grasses growing along the trail.

Additionally, there is one county-managed trail in Iowa. The Wapsi-Great Western Line Trail (designated as both a recreational trail and bike trail), located 2.6 miles (4.18 km) east of the Project. The Wapsi-Great Western Line Trail runs from the Minnesota-Iowa border south 27 miles (43.45 km) to Elma, Iowa. It is intended to connect to the Shooting Star State Trail in the future.

Lake Loise State Park (MN) is located 7.0-miles (11.26 km) east of the Project. Lake Louise State Park is the oldest, continuous recreation area in Minnesota. The park offers swimming, fishing, and paddling in its 25-acre man-made lake, as well as hiking and horseback riding. The diverse habitat in the 1,176-acre park is used for birdwatching and wildlife viewing. There are two county parks located in Iowa within the 10 miles (16.09 km) of the Project (see Table 8.8.1-2). The Wapsi-Great Western Line Bike Trail is designated as a county park and owned and managed by Mitchell County. The bike trail is split into two segments, north and south, and travels through Lake Hendricks Park in Elma, Iowa and the Wapsi-Great Western Line Recreation Area near the city of McIntire. The northern segment of the trail/park meanders through the Pinicon Alders WMA before reaching the Minnesota-Iowa border. Riverside County Park, located 5.6-miles (9.01 km) southeast of the Project in Stacyville Iowa, offers recreationists a place to camp, fish, and canoe in Little Cedar River.

Mower County has more than 250 miles (402.34 km) of state-designated snowmobile trails. While no snowmobile trails traverse the Project, portions of three trails are within 10 miles (16.09 km) of the Project. Trail 44, located east in Lake Louise State Park, is managed by the MNDNR. Trail 176, which is the largest trail in the vicinity and runs closest to the Project, is managed by the Mower County Management Committee, and trail 325 is locally managed by Heartland Sno-goers Trails.

TABLE 8.8.1-2

State and County Parks & Trails within 10 miles (16.09 km) of the Project

Park/Trail Name	Owner/Designation	Distance from Project Boundary (miles)	Location	Park Area (acres)	State
Shooting Star State Trail	State Trail	Adjacent	N	NA	MN
Lake Louise	State Park	7.0 (11.26 km)	E	1,176.5	MN
Wapsi-Great Western Line Trail & Bike Trail	County Park/Trail	2.6 (4.18 km)	SE	NA	IA
Riverside County Park	County Park	5.6 (9.01 km)	SSW	16.1	IA

Scientific and Natural Areas

SNAs are public lands designated for scientific study to help promote public understanding of rare and endangered species habitat and unique plant communities. SNAs consist of native plant and animal communities and areas of significant biodiversity that aid in keeping Minnesota's natural heritage. The goal of preserving these areas is to provide opportunities for research, education, and nature-based recreation. SNAs are not present with the Project Site; the closest SNA, Shooting Star Prairie, is located approximately 4.5 miles (7.24 km) east of the Project.

8.8.2 Potential Impacts

Several public and recreational lands are located within 10 miles (16.09 km) of the Project. However, there are no public lands located within the Project Site and the Project will not impact the Shooting Star State Trail. Therefore, direct impacts to recreational facilities are not anticipated. In addition, the number of turbines will be reduced from eleven to six, potentially reducing the number of turbines within the viewshed of recreational lands. Turbines will be sited consistent with the 3 RD X 5 RD setback from recreational lands and trails.

8.8.3 Mitigation Measures

All turbines and project facilities have been sited outside of the required setbacks for recreation resources and there are no direct impacts to recreational lands. Though the Wapsipinicon River does flow through the Project Site, no collector lines or access roads/crane paths will cross the waterbody. As there are no other direct impacts to recreational resources, mitigation measures are not required.

8.9 PUBLIC HEALTH AND SAFETY

8.9.1 Existing Resources

Electromagnetic Fields

Electromagnetic fields (EMF) include electric and magnetic fields that are present around electrical devices indoors and outdoors. Voltage or electrical chargers generate electric fields and

the flow of electricity along transmission lines, collector lines, and substation transformers generate magnetic fields. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow wire. EMF strength decreases significantly with increasing distance from the source (National Institute of Environmental Health Sciences [NIEHS], 2021).

Aviation

A review of the FAA National Airspace Systems Resources database, the AirNav Aviation Information database, Esri, and Minnesota Geospatial Commons indicated that there are no commercial airports and no known private airports within 10 miles (16.09 km) of the Project Boundary. The Project area is predominantly agricultural; therefore, crop dusting activities within the Project Boundary may occur.

8.9.2 Potential Impacts

Electromagnetic Fields

Scientific studies have not shown a biological mechanism between EMF and cancer or other adverse health effects. In 2007, the World Health Organization (WHO) conducted a review of health implications from extremely low frequency (ELF) fields, which occupies the lower part of the electromagnetic spectrum with EMF, and concluded, "…virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low level ELF and changes in biological function or disease status" (WHO, 2007).

No conclusive evidence exists that EMFs from wind facilities and their associated equipment present health concerns. EMF associated with a transformer or turbine will dissipate within 5 ft (1.5 m), and the Project was sited beyond typical dissipation distances where EMFs will be at background levels. Furthermore, all collector lines will be buried at a depth of 50 to 54 inches (1.27 m – 1.37 m) and EMF from underground collector lines dissipates within 20 ft (6.1 m) on either side because they are buried and wound with copper wires.

Aviation

Rose Creek Wind will submit FAA Form 7460 for the Project. The FAA evaluates the aeronautical compatibility and regulatory compliance under FAA Part 77. Additionally, a Tall Towers Permit and approval may be required by MnDOT, if the turbines are greater than 500 ft above ground level, prior to developing the Project to ensure the safety of airspace within Minnesota. Determinations of no hazard are anticipated in spring 2022; the Project does not anticipate any impacts to aviation.

8.9.3 Mitigation Measures

Electromagnetic Fields

No mitigation measures for EMF are proposed because no impacts related to EMF are anticipated.

Aviation

Impacts to aviation are not anticipated; therefore, no mitigation measures are proposed.

8.10 HAZARDOUS MATERIALS

8.10.1 Existing Resources

The Project Area primarily consists of agricultural land with existing turbines. Potentially hazardous materials commonly associated with agricultural activities may include petroleum products (diesel fuel, gasoline, propane, heating oil, lubricants, and maintenance chemicals), pesticides, and herbicides. Additionally, operation and maintenance of the existing turbines may require the use of hazardous materials including hydraulic oil, lube oil, grease, and cleaning solvents. Contaminants associated with asbestos and/or lead-based paint may also be associated with older farmstead structures. There is also the potential for polychlorinated biphenyls to be present in pad- or pole-mounted transformers. Furthermore, in rural settings trash or debris piles are a relatively common occurrence, especially in wooded areas.

The MPCA What's in my Neighborhood (WIMN) website (MPCA, 2021b) provides information on known and documented potential sources of soil and/or groundwater contamination. Based upon a review of the MPCA database, no sites with documented releases were identified within the Project Site. The closest potential release site is located adjacent to the northern Project Boundary and is the former Adams Landfill (MPCA IDs MND982074817 and SW187), which appears to be a closed landfill but is still managed by the MPCA (Figure 14).

The Project reviewed the Minnesota Department of agriculture's (MDA) WIMN website (MDA, 2021) and found that two small spills and two "old emergency incidents" have been reported within or the Project Area. All listings have been closed since at least 2011. EPA's Cleanups in My Community website (EPA, 2021b) was also reviewed. No sites with documented releases were identified within the Project Area.

A Phase I Environmental Site Assessment (ESA) will be completed for the Project in accordance with ASTM E2247-16 Standard Practice for Environmental Site Assessments for Forestland or Rural Property. The Phase I ESA will identify Recognized Environmental Conditions (REC), if any, in connection with the Project Site.

8.10.2 Potential Impacts

Hazardous materials used and stored during Project construction may include fuel, lubricating oil, hydraulic oil, propylene glycol, and other materials commonly required for construction vehicles and equipment. During operation a third-party vendor may maintain the turbines and may require the use and on-site storage of hazardous materials including hydraulic oil, lube oil, grease, and cleaning solvents. During operation, the Project will also require pad-mounted and grounding transformers, which commonly contain liquids for insulation, typically consisting of mineral oil.

Due to the required use and storage of hazardous materials during Project construction and operation, the potential exists for leaks and/or spills to occur. Spill-related impacts from construction are commonly associated with fuel storage, equipment refueling, and equipment maintenance. The primary concerns associated with leaks or spills would be the potential impacts resulting in soil contamination, or releases reaching the groundwater or nearby surface waters.

Hazardous wastes will be properly stored and contained during construction (in the laydown area) and operation of the Project. Where necessary, hazardous materials will be stored in a secondary containment structure. Secondary containment will ensure that if leaks occur, they will be contained.

8.10.3 Mitigation Measures

Information from the Phase I ESA will be used to avoid RECs and, if RECs cannot be avoided, they will be investigated to verify the presence or absence of contamination. In the unlikely event contamination is identified at concentrations above established criteria, remediation activities may be required.

Any wastes generated during the construction or operation of the Project will be handled and disposed of in accordance with Minnesota Rule Chapter 7045 and local rules and regulations. In addition, should more than 1,320 gallons of oil be stored at the site than a site-specific Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) will be developed for the construction and operation phases of the Project, as applicable. The SPCC Plan will detail the appropriate storage, cleanup, disposal, and transportation of hazardous wastes to ensure potential impacts are minimized.

8.11 LAND-BASED ECONOMIES

8.11.1 Existing Resources

Agriculture

Land use within the Project Site is primarily agricultural. The National Land Cover Database (NLCD, 2016) indicates that cultivated crops account for approximately 5,038 acres or approximately 95.8% of the Project Site. According to the 2017 USDA Census of Agriculture County Profile, Mower County has increased the number of farms by 1 percent from 2012-2017 with a 1 percent decrease in overall acreage from one year to the next (USDA, 2017). Mower County has approximately 1,068 active farms with approximately 447,193 acres of land in farms. In 2017, Mower County ranked sixth in Minnesota for production of Crops and 17th for livestock, poultry, and products (USDA, 2017). The market value of agricultural products sold in Mower County in 2017 was approximately $413 million. (USDA, 2017).

Approximately 22.6% of the soil within the Project Site is prime farmland with approximately 76.4% being “prime farmland if drained” (see Table 8.11.1-1). The USDA NRCS identifies prime farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land but it is not urban or built-up land or water areas. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance (USDA, 2021).

TABLE 8.11.1-1

Prime Farmland within the Project Site

Prime Farmland Type	Acres	Percent of Total Project Site
All areas are prime farmland	1,188.14	22.60%
Farmland of statewide importance	1.91	0.04%
Not prime farmland	31.74	0.61%
Prime farmland if drained	4,016.89	76.40%
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	18.88	0.36%
Total	5,258	100%

Source: NRCS, 2021d.

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 WIMN map search tool, there are 20 registered feedlots in the Project Area (MPCA, 2021X).

Forestry

Local forested land within the Project Area is generally associated with homes in the form of woodlots and along the creeks. These, however, are not typically considered economically significant forest resources.

Mining

A review of the MnDOT Aggregate Source Information System indicates one aggregate pit in the Project Area (MnDOT, 2018). According to the MnDOT Aggregate Source Information System, this pit is owned by Teigen B and was assigned the classification of "other aggregate," which are pit locations assigned a number in order to facilitate tracking of test results (MnDOT, 2018).

8.11.2 Potential Impacts

Agriculture

The Project is not expected to significantly impact agricultural land use or the general character of the area. Approximately 2.85 acres (approximately 0.05% of the Project Site) of land will be taken out of agricultural production for the life of the Project to accommodate the turbine pads and permanent access roads. Landowners may continue to plant crops near and graze livestock up to the turbine pads. In some instances, agricultural practices will be impacted by requiring new maneuvering routes around the turbine structures for agricultural equipment. Less than 0.1 percent of the Project Site will be converted to non-agricultural land use. This will not significantly alter crop production in the Project Site.

The Project is not expected to significantly impact agricultural land use or the general character of the area. Construction activities such as clearing, grading, trench excavation and backfilling, as well as the movement of construction equipment within the construction easement, may result in impacts on farmland resources. Potential impacts on soil resources include soil erosion, soil compaction, reduction of soil fertility and changes to other soil characteristics. Clearing removes protective cover and exposes soil to the effects of wind and precipitation, which may increase the potential for soil erosion and movement of sediments into sensitive environmental areas. Grading and equipment traffic may compact soil, reducing porosity and percolation rates, which could result in increased runoff potential. The majority of these impacts are temporary and related to construction activities.

No feedlots will be impacted by the Project; however, during construction, agricultural practices may be interrupted temporarily in areas that are typically farmed and construction activities may result in the temporary reduction in access to those areas and damage to drain tiles. Drain tiles will be repaired as needed, during construction. This economic impact is offset through lease payments agreed to by the landowner. Overall, long term operations will not significantly alter existing crop production in the Project Area or Mower County.

Forestry

A majority of the woodlots are associated with homesteads, which are not considered economically significant resources. Mixed forested areas account for less than 1% of the total Project Site, and very few trees are anticipated to be removed for Project construction. Therefore, impacts to forestry-based economies are not anticipated.

Mining

Project infrastructure will not be located within or near existing mines; therefore, impacts to mining resources are not anticipated. Rose Creek Wind may request to use aggregate from mining operations for use during construction. Rose Creek Wind will coordinate with the local mining operations, as appropriate. No abandoned mines are known to exist within the Project.

8.11.3 Mitigation Measures

Agriculture

Only the land for the turbine pads and permanent access roads will be taken out of crop production for the life of the Project. Once the wind turbines are constructed, all land surrounding the turbines and access roads/crane paths, including collector line routes and contractor yards can still be farmed. Revenue lost from the removal of land from agricultural production will be offset by lease payments to individual landowners according to their respective leases with Rose Creek Wind.

Rose Creek will coordinate with landowners to identify property features, such as drain tiles, that need to be avoided during construction activities and will mark the location during construction to avoid these features, where practicable. Where identified features, such as drain tiles, cannot be avoided due to routing restrictions or are incidentally damaged, the drain tile or other features will be repaired during construction and landowners will be compensated for crop damages or losses related to the damage.

Staging areas and associated infrastructure will be placed in areas where previous soil impacts have occurred to avoid impacting undisturbed farmland, where possible. Should drain tile damage or soil compaction occur as a result of temporary construction activities including staging areas, and laydown areas, appropriate measures (e.g., tile repair, soil decompaction) will be taken to ensure farmland is restored in accordance with the land lease agreement between the landowner and Rose Creek.

Rose Creek will implement the following Best Management Practices (BMPs):

- Topsoil will be stripped from any agricultural area used for traffic or vehicle parking, segregated, and replaced during restoration activities;
- Drainage problems caused by construction will be corrected to prevent damage to agricultural fields;
- Following completion of construction and during decommissioning, subsoils will be decompacted in all construction areas that will return to use as agricultural fields.
- Permanent access roads will be left for future use only if requested by the property's landowner; and

- Excess concrete will not be buried or left in active agricultural areas.

Forestry

No impacts to forestry resources are anticipated. No mitigation will be necessary.

Mining

No impacts on mining resources are anticipated. No mitigation will be necessary.

8.12 TOURISM

8.12.1 Existing Resources

Mower County offers year-round tourism and recreational opportunities. The city of Austin, the largest city in the county, has rebranded itself into an urban destination. Mower County is located about 100 miles (160.93 km) south of the Twin Cities. The Shooting Star Scenic Byway, a 32-mile-long (51.5 km) route along Highway 56, is one of Minnesota's first designated wildflower routes. The byway passes through agricultural regions and small rural towns and runs from I-90 to U.S. Highway 63 near the Iowa border.

One of the county's most popular tourist attractions is the Spam Museum in Austin, which promotes the historic Hormel culture of the area. The Hormel corporate headquarters is also located in Austin. In addition to urban activities, Mower County tourism includes outdoor recreational opportunities. As shown in Figure 3, and discussed in Section 8.8.1, there are 12 WMAs, 4 state or county parks and trails, 3 snowmobile trails, 1 SNA, and 1 WIA within 10 miles (16.09 km) of the Project. These public resources provide tourism opportunities including hiking, wildlife watching, hunting, fishing, and snowmobiling.

Additionally, the Jay C. Hormel Nature Center in Austin offers visitors year-round activities in 500 acres of prairie, forest, and wetland habitat. There are also approximately 250 miles of snowmobile trails within Mower County.

As mentioned in Section 8.8.1, the Wapsi-Great Western bike trail will eventually connect to the Shooting Star State Trail, providing Iowa recreationists a chance to enjoy Mower County's recreational opportunities and potentially drawing in more tourism.

8.12.2 Potential Impacts

Because all Project facilities are located on private lands, there will be no direct impacts to existing recreational facilities or tourism activities. Potential impacts will mostly be visual, as the Project may alter the viewshed from public lands within the vicinity. However, as this is a repowering project, turbine structures are already present within the viewshed of the Project Area. The number of turbines will be reduced from eleven to six and it is not anticipated to have an impact on tourism in this area.

During Project construction, the transportation of turbine parts and construction equipment may temporarily delay bike traffic along the Shooting Star State Trail, but any interruptions are expected to be minor and short in duration.

8.12.3 Mitigation Measures

No direct impacts to tourism are anticipated as a result of the Project; therefore, mitigation is not required.

8.13 LOCAL ECONOMIES AND COMMUNITY BENEFITS

8.13.1 Existing Resources

Based on information provided by the Minnesota Department of Employment and Economic Development (MN DEED) 2019 County Profile, educational services and health care & social assistance accounted for 26.8% of employment in Mower County. MN DEED estimates that manufacturing accounted for 21.8%, followed by retail trade at 10.4%, accommodation & food service at 6.5%, management companies at 5.9%, and public administration at 4.9% (MN DEED, 2021). Additionally, agriculture, forestry, fishing & hunting accounted for 4.73% of total county employment in 2018 (Data USA, 2021).

According to the Mower County Comprehensive Plan, the County's plan for economic growth is supported by three basic objectives. Objective 1 is to promote the continuation of long-term commercial agriculture within the County. Objective 2 is to promote the growth of new jobs and a commercial/industrial tax base in Mower County and the retention and growth of existing businesses. Lastly, Objective 3 seeks the coordination of economic development activities among all units of government through the Development Corporation of Austin and agencies representing the small cities of the County (Mower County, 2020c).

Tax Payments

The existing Rose Wind project has been providing significant long-term positive economic benefits to the state and the local economy of southeastern Minnesota. The current production tax is $0.36 per MW hour. Rose Wind is unique in that the land occupied by Project facilities, including the turbines, access roads, and most of the collector lines, is owned in fee by CED, which pays a property tax of 0.85% of the property's market value. These lands will continue to be owned by CED via a holding company also solely owned by CED, and therefore will continue to provide property tax revenue to local governments, albeit at a new valuation that does not include the Rose Wind turbines.

8.13.2 Potential Impacts

Overall, the Project will have a positive impact on the region by providing new revenue streams to participating landowners and by continuing to support the county's tax base. The new Rose Creek Wind Project will be located on leased land. The communities near the Project are expected to receive positive economic benefits as construction will necessitate the need for numerous temporary positions that include good-paying jobs that help develop a skilled clean-energy workforce. Up to 50 full time construction workers are expected to be required for the Project construction. Existing, local staff are currently planned to be retained for O&M of the Project, once complete.

Community benefits associated with Rose Creek Wind closely correspond with objectives 1 and 2 of the Mower County Comprehensive Plan under the Economic Development & Housing Element section. Objective 1 promotes the diversification of economic development and continuation of long-term commercial agriculture. Objective 2 promotes efforts to attract additional

employment opportunities and tax revenues while retaining and growing the existing business base. The Repower Project will provide participating landowners, most of whom are farmers, with supplemental incomes from the generation of wind energy. Also, wind energy generation provides ongoing economic benefits to the county. The repowered Rose Creek Wind Project will benefit local landowners through lease payments and Mower County through tax payments over the next 25 years.

Also, the local and regional purchase of products such as fuel, equipment, services, and supplies necessary to construct and operate the facilities will benefit businesses in the county as well as in the state.

Tax Payments

The Repower Project will benefit participating landowners who will receive annual lease payments. In addition, in accordance with state and county law, the Project will pay production taxes on the land and energy production to local governments.

The new Rose Creek Wind turbines and other infrastructure will be sited on lands leased from participating landowners. In this way, the Project will provide local revenue streams, even though the size of the Project in power output will be the same as the existing facility. Repowering the Project results in the injection of tax dollars into the local economy both immediately and throughout the life of the Project. These investments will benefit the community, including hotels, restaurants, gas stations, auto repair companies, tire companies, grocery stores, and other local businesses. It is anticipated that the economic impact will also expand into towns and cities within adjacent counties.

It is anticipated that the new Rose Creek Project will pay a Wind Energy Production Tax to Mower County of $1.20 per MW hour of electricity produced. This will result in an annual Wind Energy Production Tax of approximately $70,000 to $80,000 for Mower County once the Project is operational. In comparison, the existing Rose Wind had an average annual Wind Energy Production Tax of approximately $12,000 to $13,000. The Project's estimated total payments to landowners are expected to exceed $2 million over the life of the Project.

8.13.3 Mitigation Measures

Mitigation measures are not anticipated because socioeconomic impacts associated with the Project will be primarily positive with an influx of wages and expenditures made at local businesses during Project construction and an increase in the County's tax base from the construction and operation of the wind turbines. In addition, the Project will not result in permanent impacts to agricultural land after decommissioning.

8.14 TOPOGRAPHY

8.14.1 Existing Resources

Topography of the Project Area is relatively flat, with some areas of undulating, rolling relief. Based on MNDNR LiDAR data, elevations within the Project Site range from approximately 1,250 to 1,350 ft (381 to 412 m) above mean sea level. The Project Site generally slopes to the west toward the Little Cedar River.

According to the NRCS Web Soil Survey data, and based upon the representative slope, steep slopes (greater than 10 percent) are located within the Project Area (NRCS, 2021d).

8.14.2 Potential Impacts

Impacts to topography will be limited to localized grading associated with turbine construction, laydown area preparation, access roads/ crane paths, and turning radii. No significant excavation or fill beyond that required for foundations and road bases are anticipated.

Layout and siting of access roads/crane paths have been and will continue to be completed in a manner that will tie into the existing road network, where practicable, to reduce unnecessary grading.

BMPs will be implemented in accordance with the MPCA's (2000) *Stormwater Best Management Practices Manual* and the approved Stormwater Pollution Prevention Plan (SWPPP), to ensure erosion and sedimentation are minimized around construction areas.

8.14.3 Mitigation Measures

Following decommissioning of the Project, lands will be restored to pre-construction conditions to the extent possible. No additional mitigation is anticipated.

8.15 SOILS

8.15.1 Existing Resources

Overall, the Project Site is comprised of 38 soil types as shown on Figure 13 (USDA NRCS Web Soil Survey). Soils within the Project Site range from poorly drained to somewhat well drained. Three soil types account for over half of the soils (68%) within the Project Site and are generally composed of silt loams to clay loams with 0-3% slopes. Twelve of the soil types within the Project Site are classified as hydric. All soil types within the Project Site are listed in Table 8.15.1-1 below.

TABLE 8.15.1-1

Soil Types within the Project Site

Soil Symbol	Map Unit Name	Area (Acres)	Percent of the Site	Hydric	Erosion Hazard
79B	Billett fine sandy loam, 2 to 6 percent slopes	16.17	0.31	No	Slight
88	Clyde silty clay loam, 0 to 3 percent slopes	655.97	12.48	Yes	Slight
1974	Coland, frequently flooded-Spillville, occasionally flooded complex, 0 to 2 percent slopes	0.02	0.00	No	Slight
27A	Dickinson fine sandy loam, 0 to 2 percent slopes	2.16	0.04	No	Slight
27B	Dickinson fine sandy loam, 2 to 5 percent slopes	16.65	0.32	No	Slight
135	Donnan silt loam	25.93	0.49	No	Slight
516A	Dowagiac loam, 0 to 2 percent slopes	13.83	0.26	No	Slight
516B	Dowagiac loam, 2 to 6 percent slopes	40.06	0.76	No	Moderate
479	Floyd silt loam, 1 to 4 percent slopes	167.23	3.18	No	Slight

TABLE 8.15.1-1

Soil Types within the Project Site

Soil Symbol	Map Unit Name	Area (Acres)	Percent of the Site	Hydric	Erosion Hazard
1841	Hayfield loam, loamy substratum	7.39	0.14	No	Slight
465	Kalmarville loam, frequently flooded	11.38	0.22	Yes	Slight
24B	Kasson silt loam, 1 to 4 percent slopes	179.70	3.42	No	Moderate
30B	Kenyon silt loam, 2 to 6 percent slopes	16.87	0.32	No	Moderate
485	Lawler silt loam	9.21	0.18	No	Slight
244B	Lilah sandy loam, 2 to 6 percent slopes	4.18	0.08	No	Slight
252	Marshan clay loam, 0 to 2 percent slopes, rarely flooded	12.86	0.24	Yes	Slight
253	Maxcreek silty clay loam	23.47	0.45	Yes	Slight
631	Oran silt loam, 1 to 4 percent slopes	43.29	0.82	No	Moderate
2A	Ostrander loam, 0 to 2 percent slopes	283.38	5.39	No	Slight
2B	Ostrander loam, 2 to 5 percent slopes	33.41	0.64	No	Moderate
539	Palms muck	1.91	0.04	Yes	Slight
634	Protivin silt loam	38.71	0.74	No	Moderate
99B	Racine loam, 2 to 5 percent slopes	18.18	0.35	No	Moderate
99A	Racine silt loam, 0 to 2 percent slopes	50.55	0.96	No	Slight
M511A	Readlyn silt loam, 1 to 3 percent slopes	223.71	4.25	No	Slight
635	Riceville silt loam	76.32	1.45	No	Slight
307	Sargeant silt loam	29.18	0.56	Yes	Slight
467	Sawmill silty clay loam, shallow loess, 0 to 2 percent slopes, occasionally flooded	18.88	0.36	Yes	Slight
637	Schley silt loam	184.46	3.51	No	Slight
517	Shandep clay loam	2.98	0.06	Yes	Slight
23	Skyberg silt loam, 0 to 3 percent slopes	1305.38	24.83	No	Slight
1884	Stateline silt loam	15.51	0.30	Yes	Slight
1812	Terril silt loam	7.21	0.14	No	Slight
M515A	Tripoli clay loam, 0 to 2 percent slopes	1631.68	31.04	Yes	Slight
393	Udolpho silt loam	10.07	0.19	Yes	Slight
1904	Udolpho silt loam, loamy substratum	69.00	1.31	Yes	Slight
483A	Waukee loam, 0 to 2 percent slopes	6.81	0.13	No	Slight
483B	Waukee loam, 2 to 5 percent slopes	3.87	0.07	No	Moderate

8.15.2 Potential Impacts

Construction and operation of the Project will result in short and long-term impacts to soils within the Project Site. Short-term impacts will result from the clearing of vegetation, generation of dust,

and the excavation, stockpiling, and redistribution of soils. These activities are described further in Section 10. During construction, there is also the potential for localized soil erosion and sedimentation. Long-term impacts will include soil compaction in areas of permanent disturbance. Soils that are the most prone to compaction are soils with high moisture content or medium to fine textures. Soils within the Project Site may be prone to compaction from heavy construction equipment, especially when wet. Refer to Section 8.11 for additional information regarding impacts related to soil designated as prime farmland.

A SWPPP will be developed prior to initiating earth-disturbing activities. Impacts, including sedimentation and erosion, will be minimized by developing and implementing BMPs in accordance with the SWPPP. BMPs may include mulching, hydroseeding, erosion control blankets, silt fence installation, jute matting, or revegetation. Water and chemical application may be used to suppress dust.

8.15.3 Mitigation Measures

Following the completion of construction, impacted soils that will not continue to be used for operation of the Project will be decompacted and restored to preconstruction conditions in accordance with landowner agreements. Additional impacts are not anticipated; therefore, no additional mitigation is necessary.

8.16 GEOLOGIC AND GROUNDWATER RESOURCES

8.16.1 Existing Resources

The surficial geology of the Project Area primarily consists of Pleistocene-aged glacial till and stratified sediment deposited during or prior to the Illinoian glaciation, which occurred between approximately 191,000 and 130,000 years before present, as well as younger stratified and eolian sediments deposited by glacial meltwater of the last glaciation, the Wisconsinan, which took place between approximately 75,000 and 11,000 years before present. (Minnesota Geologic Survey (MGS), 1998).

Prior to the Wisconsinan glaciation, the majority of southern Minnesota was covered with glacial deposits from the Laurentide ice sheet, specifically during the Illinoian glaciation. Around 75,000 years ago, the Wisconsinan glaciation began, and during this period, the Laurentide ice sheet fed the Des Moines lobe, advancing it southeast across Minnesota, before finally reaching central Iowa, near Des Moines, approximately 14,000 years ago (Wright, 1972). In Mower County, the advancement of the Des Moines lobe cut into the landscape deposited by the Illinoian glaciation, reworking till along the way. Around 13,000 years ago, warmer weather initiated a general slow retreat of the glacial front with occasional advances still occurring depending on climate micro-trends. Around 11,300 years ago, the Des Moines lobe completely disappeared from the area (Wright, 1972).

Due to the presence of buried bedrock valleys, depth to bedrock ranges from less than 25 ft (7.62 m) below ground surface (bgs) to approximately 200 ft (60.96 m) bgs as shown on Figure 14 (MGS, 1998). Bedrock formations underlying the Project Area consist primarily of dolostone, limestone, and shale units deposited during the Middle Devonian period. The uppermost bedrock unit underlying the Project Area is the Lithographic City Formation, underlain by the Coralville Formation, Eagle Center Members, and Chickasaw Member of the Little Cedar Formation (MGS, 1998).

The Lithographic City Formation is described in the Geologic Atlas of Mower County Bedrock Geology Map (Mossler, 1998) as limestone and dolostone layered in thin to medium beds. The Coralville Formation and Hinkle and Eagle Center Members of the Little Cedar Formation are described as dolostone, shale, and limestone. The dolostone in these units is described as yellowish gray or light brown, thin to thick bedded, and generally finely crystalline (Mossler, 1998). The Chickasaw Member is described as silty, light-gray to medium-gray shale (Mossler, 1998).

Groundwater within Minnesota is separated into six provinces based on the geology and bedrock of the various regions. The Project Area is located within Province 2 (South-central) (MNDNR, 2021c). According to the MNDNR Groundwater Atlas, the glacial till in Province 2 (South-central) is typically fine-grained and tends to only contain limited surficial and buried sand aquifers. Province 2 contains sedimentary bedrock aquifers which are commonly utilized (MNDNR, 2021c). The Little Cedar River is located west of the Project.

According to the Minnesota Department of Health (MDH) Minnesota County Well Index (CWI; MDH, 2021), wells are interspersed throughout the Project Site. Wells within the Project Site appear to be associated with the Cedar Valley Formation. Based on the CWI, there are 31 known wells within the Project Site and the depths within the Project Site vary widely, from 65 to over 400 ft (121.92 m) in depth, with most being in excess of 100 ft (30.48 m) in depth (MDH, 2021). The nearest well is located over 300 ft from a turbine and the second nearest well is located over 1,300 ft from a turbine.

8.16.2 Potential Impacts

Footings designed to support turbines will in some cases require minor impacts to glacial drift. Geotechnical testing will occur at turbine locations prior to construction to determine soil stability and depth to bedrock.

Major impacts to groundwater resources and wells are not expected from Project-related activities due to turbine setbacks from water wells and the minimal water-related needs of the Project. Water used for dust abatement and other construction needs would either come from a local well or may be trucked in from a suitable local source and stored at the laydown yard. The source of water will be determined closer to construction. Construction dewatering may occur depending on the weather, soil conditions, and specific locations. Dewatering consists of the removal of surface water and/or groundwater by diverting and/or removing it, as needed for construction. Water use and dewatering activities may require a water appropriation from the MNDNR and will be secured prior to construction, if necessary.

8.16.3 Mitigation Measures

Construction and operation of the proposed Project is not expected to impact geologic or groundwater resources; therefore, mitigation is not anticipated. The Applicant will obtain necessary water use and dewatering permits from the MNDNR, prior to construction.

8.17 SURFACE WATER AND FLOODPLAIN RESOURCES

8.17.1 Existing Resources

The Project Site is located within two U.S. Geological Survey (USGS) Hydrologic Unit Code 8 watersheds: Upper Cedar River (07080201) and Upper Wapsipinicon (07080102), which are both part of the larger Upper Mississippi River System (USGS, 2020a). Intermittent streams are those

with only seasonal water flow and a perennial stream maintains flow throughout the year. The waterbodies in the Project Site include tributaries to the Little Cedar River and the Wapsipinicon River (Figure 11). Wetland and waterbody delineations were also completed in most areas with proposed infrastructure in July 2021 and additional wetland and waterbody surveys are planned for spring 2022; a supplemental report will be provided to PUC. Three intermittent streams were identified (Figure 11); the Wetland Delineation Report is provided in Appendix F. National Hydrography Dataset (NHD) information is shown on Figure 11 in areas outside of the waterbody delineation.

The topography across the Project Area is generally flat to gently rolling (Figure 8). The landform and hydrology of large portions of the Project Area have been modified to improve drainage and facilitate agricultural crop production. Because agricultural practices alter surface water flow patterns, any potential waterways will be field-verified to confirm their presence and jurisdictional potential.

Public waters are identified on Minnesota's PWI maps that display waters of the state and are designated as public waters under MNDNR's Public Waters Permit Program (Revisor of Statutes, State of Minnesota, 2016). One waterway listed on the state PWI, a tributary to Little Cedar River, is located in the north central portion of the Project. Public waters have a designated 50-foot protection buffer requirement according to the MN Buffer Law (MNDNR, 2019). Table 8.17.1-1 below outlines PWI watercourses within the Project Site (Figure 11, MNDNR, 2020a).

TABLE 8.17.1-1

PWI Watercourses within the Project Site

PWI Type	PWI Feature Name	DNR Unique ID	Length within Project Site (miles)
Public Water Inventory Watercourse	Unnamed stream (tributary to Little Cedar River)	123576	1.28 (2.06 km)

Based on Federal Emergency Management Agency (FEMA) floodplain maps, no FEMA-designated floodplains are present within the Project Site (see Figure 9; MNDNR, 2021d).

Section 303(d) of the Clean Water Act (CWA) requires each state to list streams and lakes that are not meeting their designated uses because of excess pollutants. This list is to be updated every 2 years. There are no recorded waterbodies within the Project Site listed as impaired by the MPCA, per the 2018 Impaired Waters List (MPCA, 2021c). A portion of the Wapsipinicon River approximately 0.75-mile east of the Project Boundary is listed as impaired for benthic macroinvertebrate bioassessments, *Escherichia coli*, and fishes bioassessments, which can be caused by construction.

The MNDNR Commissioner may formally designate lakes for wildlife management, which allows the MNDNR to temporarily lower lake levels to improve wildlife habitat and regulate motorized boats and recreational vehicles. No such designated lakes are present within the Project Site (MNDNR, 2016a). No other special waters are located within the Project Site, including sensitive lakeshores; trout streams; outstanding resource value waters; State Wild, Scenic or Recreation Rivers; or Migratory Waterfowl Feeding and Resting Areas (MWFRA, MPCA, 2021c).

Pursuant to Section 5(d) of the National Wild and Scenic Rivers Act, the NPS maintains the Nationwide Rivers Inventory (NRI), a listing of more than 3,200 free-flowing river segments in the United States that are believed to possess one or more "outstandingly remarkable" natural or cultural values judged to be at least regionally significant (NPS, 2017). There are no NRI-listed

rivers within the Project Area. The closest NRI segment listed is the Shell Rock River, approximately 25 miles (40.23 km) west of the Project (NPS, 2017).

8.17.2 Potential Impacts

The Project was designed to avoid or minimize impacts to surface waters. Permanent impacts to surface waters may occur from the installation of permanent culverts associated with roadway access to turbine locations, without impeding natural hydrology of the landscape.

Temporary impacts to surface waters may result from the installation and removal of temporary waterway crossings placed below the ordinary high-water mark to allow for vehicle and equipment access throughout the Project. Temporary impacts to surface waters may also occur when collector lines are installed beneath waterbodies. During this installation, temporary dewatering may be required to ensure the line is safely installed.

Where necessary, the collector lines will be installed under waterways using the directional bore method, which is not anticipated to permanently or directly impact waterways. Based on the field delineation and the NHD, collector lines will be installed under waterways using the directional bore method. There is also limited potential for groundwater dewatering associated with the placement of the concrete collar around the base of turbine foundations. Permanent dewatering will not occur. Rose Creek will work with the MNDNR and USACE to obtain all necessary licenses, permits, or approvals prior to conducting waterway crossings or any work within waterways.

Construction activities such as clearing, grading, trench excavation, and backfilling may result in sedimentation, erosion, and stormwater runoff to adjacent surface waters. BMPs will be implemented to protect water quality of nearby streams, wetlands, or other surface waters. Permanent impacts to floodplains and surface waters, with the exception of potential permanent culvert installation as described above, are not expected to occur from the development of the Project.

While significant dewatering is not anticipated, it may be necessary in conjunction with deeper excavations, foundation installation, or collector line installation under waterways, based on site conditions. Sediment basins and filtration systems can help filter the dewatered water before it is discharged to a surface water within uplands. Dewatering will be conducted in a manner such that the velocity of the discharged water will not cause scouring of the receiving area. If the receiving area is a structural BMP (i.e., basin or sump), the design of the BMP will be based on the anticipated flow from the dewatered area. Should dewatering occur, measures to address dewatering may include the following to ensure sediment laden water will not be directly discharged to surface waters.

- Constructing a temporary sediment trap for pretreatment of water discharge;
- Use of a portable sediment containment system such as dumpsters;
- Application of natural based flocculent technology such as chitosan in sediment traps or a series of ditch checks to contain sediment;
- Discharge water through a series of fiber logs or a rock weeper into a large, vegetated buffer area;
- Provide energy dissipation and erosion control BMPs at all discharge points; and

- Utilize a dewatering bag to ensure discharged water does not contribute sedimentation to receiving waters.

A National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) permit will be obtained prior to construction. The MPCA, which administers the NPDES/SDS, requires a SWPPP be designed for construction activities to prevent sedimentation and erosion through the implementation of BMPs. Measures included in the SWPPP should be sufficient to ensure no significant impacts to surface waters and floodplains. Potential BMPs onsite include using silt fencing, straw waddles, containing excavated material, protecting exposed soils, stabilizing restored materials, and re-vegetating disturbed areas. The type of BMP implemented will vary depending upon site conditions such as slope gradients and the susceptibility of soil to wind and water erosion. No surface water mitigation is anticipated at this time.

8.17.3 Mitigation Measures

Rose Creek has and will continue to design and construct the Project to minimize impacts to waterbodies to the extent practicable. Should minor, unavoidable temporary impacts occur as a result of construction, Rose Creek is committed to returning these areas to pre-construction conditions. All necessary permits will be secured prior to construction.

8.18 WETLANDS

8.18.1 Existing Resources

Wetland and waterbody delineations were completed in areas of most proposed infrastructure in July 2021; four wetlands were identified during the survey and within the Project Area. The Wetland Delineation Report is provided in Appendix F of this application. NWI information is shown on Figure 10 in areas outside of the wetland delineation. Additional wetland and waterbody delineations will occur in the spring of 2022 to cover all areas of proposed infrastructure.

Based on the MNDNR update to the USFWS NWI and the wetland delineation survey data, wetlands are concentrated near waterbodies in low-lying areas (drainageways and ravines) and generally consist of freshwater emergent wetlands, freshwater forested wetlands, and riverine wetlands (see Figure 10) (MNDNR, 2021e). Based on a review of aerial images, some of the wetlands within the Project's agricultural settings appear to exhibit anthropogenic disturbance.

Approximately 24.64 acres of delineated and/or MNDNR/NWI mapped wetlands are present within the Project Site. The delineated and NWI wetlands present within the Project Site are summarized in Table 8.18.1-1 below and depicted on Figure 10.

TABLE 8.18.1-1

Delineated and NWI Wetlands within the Project Site

Wetland Type	Project Acres	% of Project Site
Forested Wetland	0.15	<0.1%
Riverine Wetland	0.72	<0.1%
Seasonally Flooded/Saturated Emergent Wetland	23.07	0.44%
Shrub Wetland	0.69	<0.1%
Total	24.64	0.47%

In the state of Minnesota, some wetlands are designated as PWI Wetlands. PWI Wetlands are defined in Minnesota Statute 103G.005, Subdivision 15a as "All types 3, 4, and 5 wetlands as

defined in USFWS Circular No. 39 (1971 edition), not included within the definition of public waters, that are ten (10) or more acres in size in unincorporated areas or 2.5 acres or more in incorporated areas" (MNDNR, 2021f). No PWI Wetlands are present within the Project Site (MNDNR, 2020a).

Calcareous fens are a rare and distinctive wetland type characterized by non-acidic peat. Calcareous fens are provided special protection under Minnesota Statute 103G.223, including against impacts such as being drained, filled, altered, or degraded. There are approximately 200 known locations of calcareous fens within Minnesota. They depend on a constant supply of upwelling groundwater that is rich in calcium and other minerals. This results in a calcium rich environment that supports unique and rare plants (MNDNR, 2018a). There are no known calcareous fens within the Project Area or within Mower County (MNDNR, 2016b).

In the State of Minnesota, activities that may temporarily or permanently impact wetlands, lakes, and watercourses may be regulated by several permit programs. Any PWI-listed wetland is protected at the state level by the MNDNR Public Waters Work Permit Program. A permit may be required from the MNDNR for work affecting the course, current, or cross-section of public waters, including public waters wetlands. Wetlands not listed in the PWI are typically regulated under the Minnesota Wetland Conservation Act (WCA) of 1991. The WCA is administered by local government units (LGUs) with oversight from the Minnesota BWSR. The LGU responsible for administering the WCA in Mower County is the Mower SWCD. Wetlands may also be federally protected under Section 404 of the CWA. A permit is required from the USACE (St. Paul District) for activities discharging dredged or fill material into more than one tenth of an acre of Waters of the U.S.

8.18.2 Potential Impacts

Turbines are currently proposed to be sited in upland, higher elevation areas to maximize the wind resource and, as such, are anticipated to avoid wetlands and surface waters that are typically found at lower elevations. Project infrastructure and access roads will be designed and sited to avoid or minimize permanent impacts to wetlands to the greatest extent possible. Temporary impacts to wetlands may occur based on construction corridors and workspaces.

Formal wetland delineations were completed on July 26, 2021, within an approximately 196-acre survey area. The survey area encompassed most Project infrastructure areas including proposed turbine locations and collector line alignments. Based on the currently proposed layout, wetlands will be crossed by collector lines using the directional bore method. No aboveground structures will be placed in wetlands; however, an additional wetland and waterbody delineation will be completed in spring 2022; a supplemental report will be provided to the PUC. No wetlands will be permanently impacted by the Project. If it is determined during final Project siting that permanent impacts to wetlands cannot be avoided, Rose Creek will coordinate with the appropriate agencies to obtain necessary permits.

A SWPPP will be prepared and a NPDES/SDS permit will be obtained prior to construction. BMPs will be employed to ensure that excavated material is contained, exposed soil is protected, restored material is stabilized, and disturbed areas are revegetated with non-invasive species. Minimizing soil erosion near wetlands helps to protect the wetland water quality, reduces the likelihood for fill of the wetland, and helps to maintain the integrity of the wetland. As such, significant adverse Project-related impacts to wetlands are not anticipated because of design considerations and the implementation of stormwater BMPs.

8.18.3 Mitigation Measures

Compensatory mitigation may be required if certain state and/or federal wetland impact thresholds are surpassed. The USACE may require compensatory mitigation to ensure that the regulated activity results in no more than minimal adverse environmental effects; mitigation typically applies only to projects with permanent impacts to Waters of the U.S. and may be required at the discretion of the USACE. Currently, compensatory mitigation is not anticipated for the Project.

8.19 VEGETATION

8.19.1 Existing Resources

According to the MNDNR Ecological Classification System, the Project is located within the Oak Savanna subsection (222Me) of the Minnesota and Northeast Iowa Morainal section of the Eastern Broadleaf Forest Province. This region was historically dominated by Bur oak savanna, but areas of tallgrass prairie and maple-basswood forest were common (MNDNR, 2021g). In its current state, agriculture is the primary land use in this region. Fire, tornados, and high wind events can create significant disturbances in this subsection (MNDNR, 2021g).

Based on the USGS NLCD, approximately 96% of the Project Site is used for cultivated crops (NLCD, 2016). Other land types include developed open space (2.4%) and hay/pasture (0.27%), with all other land cover categories composing less than 1% of the Project Site. See Table 8.19.1-1 below and Figure 6 for a full list and depiction of land cover types within the Project area.

TABLE 8.19.1-1

Land Cover Types within the Project Site

Land Cover Types	Acres	% of Project Site
Cultivated Crops	5,038	95.8%
Deciduous Forest	0.50	0.01%
Developed, High Intensity	0.51	0.01%
Developed, Low Intensity	45.2	0.86%
Developed, Medium Intensity	9.67	0.18%
Developed, Open Space	125.43	2.39%
Emergent Herbaceous Wetlands	10.44	0.219%
Hay/Pasture	14.20	0.27%
Herbaceous	13.10	0.25%
Mixed Forest	1.11	0.02%
Total	5,258	100%

Western EcoSystems Technologies, Inc. (WEST) conducted a desktop assessment to identify potentially undisturbed grasslands within the Project Area that may contain native prairie. Aerial imagery and other publicly available data sources were reviewed to identify existing native plant communities (NPC). Additional potentially undisturbed grassland areas were identified and classified as either potential prairies or probable degraded grasslands. For more information on the data sources and methods used in the native prairie desktop assessment, see the Native Prairie Desktop Assessment in Appendix K.

Nineteen potentially undisturbed grassland areas are potentially present within the Project Area, including one potential prairie and five probable degraded grasslands within 100 ft of proposed Project infrastructure – specifically, collector lines and access roads. All proposed turbine

locations are in actively farmed fields. Potential prairie areas showed no evidence of tilling or other confirmed soil disturbance and may provide suitable habitat for native prairie vegetation. Probable degraded grasslands included grassy agricultural swales and road ditches with a high likelihood of past disturbance (typically from road and/or utility construction) and/or ongoing disturbance from mowing, spraying, and adjacent agricultural land uses. Degraded grasslands in southern Minnesota are typically dominated by invasive cool-season pasture grasses, exhibit low species diversity, and are unlikely to contain native prairie.

No MNDNR-designated railroad right-of-way prairies or Minnesota Biological Survey (MBS) native prairies (MNDNR, 2017, 2021c), MBS NPC (MNDNR, 2021p), or Sites of Biodiversity Significance (SOBS) are located within the Project Site. A review of the MBS data identified multiple SOBS and NPCs within 1 mile (1.61 km) of the proposed Project. Refer to Section 8.21.1 for additional information on SOBS and NPCs.

8.19.2 Potential Impacts

Vegetation will be removed during construction and installation of Project infrastructure, including turbine pads, access roads/crane paths, and collector lines. Less than one half of one percent of the total Project Site will be permanently converted from its current land use and the majority of Project infrastructure will be located in agricultural lands.

Temporary vegetation impacts will also occur during construction and will be associated with activities such as access road improvements, trenching of collector lines, the use of laydown areas and construction easements. Proposed laydown areas and construction easements have been routed primarily on agricultural lands.

The Project will avoid woodlands, shrublands, potentially undisturbed grasslands (i.e., potential prairies and probable degraded grasslands), and water resources to the extent practicable. In addition, the Project infrastructure will avoid SOBS and state-designated NPCs. Rose Creek plans to field verify potential prairie areas with a qualified biologist in the spring of 2022 and will submit a report of its findings to the MPUC and MNDNR.

In the event that the spring 2022 field verification identifies native prairie within areas of proposed Project infrastructure or construction activities, Project designs or construction methods will be modified to avoid disturbance to these areas. Therefore, no impacts to native prairies are anticipated.

8.19.3 Mitigation Measures

Rose Creek has and will continue to design and construct the Project to minimize impacts to natural communities to the extent practicable.

Should minor, unavoidable temporary impacts occur to degraded grasslands, adjacent wetlands and/or shrubland as a result of construction, Rose Creek is committed to restoring and seeding these areas to previous conditions, as appropriate for the region and landowner agreement.

Potential native prairies will be field-verified and, if present, will be avoided.

In the event that impacts to field-verified native prairie areas are unavoidable, Rose Creek will coordinate with the MNDNR and MDOC and if deemed necessary will prepare a Native Prairie Protection Plan, which will document the minimization or mitigation measures that would be

implemented to reduce adverse effects to potential native prairies during Project construction, restoration, and operation. Land cover mapping within the Project Site indicates that nearly all Project development will occur in agricultural fields. Mitigation measures will include restoring non-agricultural vegetation areas to pre-construction conditions using a seed mix consistent with state requirements.

No impacts to state-designated or field-verified native prairies are anticipated; therefore, compensatory mitigation is not proposed.

Land cover mapping within the Project Site indicates that nearly all Project development will occur in agricultural fields. Mitigation measures will include restoring non-agricultural vegetation areas to pre-construction conditions using a native seed mix consistent with state requirements.

8.20 WILDLIFE

8.20.1 Existing Resources

The existing Rose Wind Project has been operating since 2004, prior to the issuance of the USFWS voluntary *Land-Based Wind Energy Guidelines* (WEG; USFWS, 2012), the *Eagle Conservation Plan Guidance: Module 1 – Land-based Wind Energy, Version 2* (ECPG; USFWS, 2013), the MNDNR *Guidance for Commercial Wind Energy Projects* (MNDNR, 2018b), and the MNDNR and DOC-EERA *Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems* (Mixon et al., 2014). As a result, formal WEG Tier 1 or Tier 2 site screening and characterization studies and Tier 3 field surveys were not required or completed prior to the construction of the existing Rose Wind Project. In addition, Tier 4 post-construction fatality monitoring (PCM) was not required or completed when operation commenced.

The siting and development process for the proposed Project followed the tiered process described in the WEG and ECPG, as well as wind energy guidance from the MPUC, MNDNR, and DOC-EERA. Project studies related to wildlife resources identified are described below.

Potential and Observed Wildlife Usage

Wildlife species, including birds, mammals, reptiles, and amphibians, with the potential to occur within or near the Project were determined through Tier 1 and 2 site evaluations (Appendix G), Tier 3 field surveys, and available desktop data sources, including MNDNR Natural Heritage Information System (NHIS), USFWS Information for Planning and Consultation (IPaC). The following section includes a discussion of general wildlife resources within the Project Area. Additional details regarding protected species and other rare and unique resources, such as known occurrences within the Project Area, are covered in Section 8.21.

Table 8.20.1-1 provides a summary of the Tier 1, Tier 2, and Tier 3 studies completed for the proposed 5,258-acre Project Area. Completed study reports, including the Tier 1 and Tier 2 Report, 2021 Raptor Nest Survey, and Northern Long-eared Bat Habitat Assessment, are provided in the Application as appendices (see Table 8.20.1-1). Avian use and acoustic bat use surveys have also been completed at the Project; survey reports will be provided in early 2022.

TABLE 8.20.1-1

Wildlife Studies within the Project Area

Study	Field Survey Dates (if applicable)	Report Completion Date (Prepared by)
Tier 1 and Tier 2 (Appendix G)	Not Applicable	May 2021 (Merjent)
Avian Use Surveys	January to December, 2021	Pending (WEST)
Raptor Nest Surveys (Appendix H)	March and April, 2021	April 2021 (WEST)
Northern Long-eared Bat Habitat Assessment (Appendix I)	Not Applicable	April 2021 (WEST)
General Bat Acoustic Surveys	April to October, 2021	Pending (WEST)

Birds

The Minnesota Ornithologists' Union (MOU) has recorded 184 species of birds in Mower County over the last 20 years; 48 of these include confirmed breeding records (MOU, 2021). The LeRoy and Austin USGS Breeding Bird Survey routes (approximately 8 and 17 miles from the Project, respectively) and one National Audubon Society Christmas Bird Count point in Austin, Minnesota (approximately 14 miles from the Project), have collectively recorded 121 unique bird species in the Project Area (USGS, 2018; National Audubon Society, 2021a). Public data from the eBird database indicates that 263 species have been recorded in Mower County, Minnesota (eBird, 2021).

Based on the agricultural land use within and surrounding the Project and the avian species most commonly recorded in Mower County, species with the highest potential for occurrence are those found in cultivated fields, pasturelands, and other disturbed areas. These species include passerines such as European starling (*Sturnus vulgaris*), black-capped chickadee (*Poecile atricapillus*), American crow (*Corvus brachyrynchos*), American robin (*Turdus migratorius*), red-winged blackbird (*Agelaius phoeniceus*), and common grackle (*Quiscalus quiscula*); waterfowl such as the Canada goose (*Branta canadensis*) and mallard (*Anas platyrhynchos*); and raptors such as red-tailed hawk (*Buteo jamaicensis*) and bald eagle (*Haliaeetus leucocephalus*; eBird, 2021).

State-listed species and species of special concern (SPC) have also been documented in Mower County (eBird, 2021; MNDNR, 2020b). These include three state-endangered species: Henslow's sparrow (*Centronyx henslowii*), loggerhead shrike (*Lanius ludovicianus*), and horned grebe (*Podiceps auritus*); and six SPC: red-shouldered hawk (*Buteo lineatus*), Forster's tern (*Sterna forsteri*), American white pelican (*Pelecanus erythrorhynchos*), purple martin (*Progne subis*), lark sparrow (*Chondestes grammacus*), and Bell's vireo (*Vireo bellii*).

Avian Use Surveys

Avian and eagle use surveys were conducted between January and December 2021. The objective of the avian use surveys was to characterize spatial use of the Project Area by diurnal birds across seasons, with special attention to eagles, which are federally protected by the Bald and Golden Eagle Protection Act (BGEPA), and species designated as state-listed or as Species in Greatest Conservation Need (SGCN) in Minnesota (MNDNR, 2016c). Surveys followed guidance from the WEG and ECPG, as well as the MNDNR and DOC-EERA *Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota* (Mixon et al., 2014). Survey methods use a fixed-point count methodology similar to Reynolds et al. (1980); this approach was discussed with the MNDNR and MNDOC and was approved on February 25, 2021, and March 3, 2021, respectively (see agency correspondence in Appendix A).

Each of nine survey points (providing 35% coverage of the original 12,745-acre Project Site described in the February 2021 survey study plan and 41% coverage of the current 5,258-acre Project Site discussed in this Application) were surveyed monthly for 70 minutes for 12 consecutive months. Each survey was subdivided into two segments. During the initial 10-minute segment, all small birds observed within a 100-meter radius of the survey point were recorded; during the subsequent 60-minute segment, all eagles and other large birds observed within an 800-meter radius were recorded. Additionally, any special status species (i.e., federally and state-listed species, Minnesota SPC, and Minnesota SGCN) observed incidentally were recorded while in the Project Area. In total, monthly bird use surveys equated to 14 survey hours per fixed-point survey location, or 126 total survey hours during the study.

No state-listed threatened or endangered species were documented during avian use surveys in 2021. Twenty-four large bird species were identified during surveys, including five raptor species: bald eagle (28 observations totaling 18 eagle exposure minutes; federally protected under the BGEPA), red-tailed hawk (22 observations), American kestrel (*Falco sparverius*; five observations), Cooper's hawk (*Accipiter cooperii*; two observations), and northern harrier (*Circus hudsonius*; two observations). Two groups of Minnesota SPC American white pelicans were also observed during surveys (two observations containing 23 and eight individuals). The most abundant large bird species recorded include rock pigeon (*Columba livia*; 435 observations) and American crow (208 observations). Nineteen small bird species were identified during surveys; the most abundant small bird species recorded include red-winged blackbird (95 observations), common grackle (39 observations), and American goldfinch (*Spinus tristis*; 33 observations). Minnesota small SGCN bird species observed during surveys include dickcissel and sedge wren; large SGCN bird species include American kestrel, northern harrier, and upland sandpiper (*Bartramia longicauda*). Reports will be prepared and submitted and the Bird and Bat Conservation Strategy (BBCS) will be updated after avian use survey results have been compiled (updates anticipated after March 2022).

Raptor Nest Surveys

Tier 3 eagle and raptor nest surveys were conducted during the 2021 breeding season. A hybrid ground-based and aerial survey was conducted to locate bald eagle and other raptor nests within two miles of the original 12,745-acre Project Boundary. The aerial survey was conducted in accordance with the guidance provided in the ECPG, the *Interim Golden Eagle Technical Guidance* (Pagel et al., 2010), and the *Updated Eagle Nest Survey Protocol* (USFWS, 2020a; USFWS, 2020b). The ground-based survey was conducted following methods adapted from the ECPG and the *Updated Eagle Nest Survey Protocol*. MNDNR and MNDOC approved the survey study plan on February 25, 2021, and March 3, 2021, respectively (see Appendix A).

Nest identification surveys were conducted prior to leaf-out; the ground-based survey was conducted on March 5, 2021, followed by the aerial survey on March 12, 2021. The ground-based survey involved driving all public roads within the survey area to scan potential habitat and identify nests. Ground-based surveys were supplemented with a helicopter aerial survey in areas of potential high-quality raptor nesting habitat, including areas of dense forest and along river corridors within the survey area, and other areas where habitat visibility from public roads was limited. Surveys incorporated historical bald eagle nest locations provided by the USFWS (M. Rheude, 2021). A ground-based follow-up survey was conducted on April 15, 2021 to confirm the occupancy and activity status of one potential bald eagle nest.

Six raptor nests representing three identifiable species were detected during the raptor nest surveys on March 5 and 12, 2021 (Figure 1 in Appendix H). No raptor nests were documented

within the original 12,745-acre Project Site or the current 5,258-acre Project Site. Three occupied and active bald eagle nests were documented within the survey area (nests 18117, 18119, and 1759). All three bald eagle nests are located more than 2.0 miles from the closest Project turbine; the closest nest (18117) is approximately 2.2 miles south of turbine T4. Additional raptor nests documented during the surveys included one occupied and active great horned owl (*Bubo virginianus*) nest that was consistent in size and structure with a bald eagle nest (nest 18118), one occupied and active red-tailed hawk nest, and one occupied and inactive red-tailed hawk nest. See the *2021 Raptor Nest Survey* report in Appendix H for additional information.

Mammals

According to the MNDNR, an estimated 78 mammal species have the potential to occur in Minnesota. Mammals common to Minnesota that may be found in Mower County include the badger (*Taxidea taxus*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), red and gray fox (*Vulpes* and *Urocyon cinereoargenteus*), beaver (*Castor canadensis*), mink (*Neovison vison*), short-tailed weasel (*Mustela erminea*), groundhog (*Marmota monax*), muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), eastern cottontail (*Sylvilagus floridanus*), Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), fox squirrel (*Sciurus niger*), gray squirrel (*Sciurus carolinensis*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), chipmunk (*Tamias minimus*), western harvest mouse (*Reithrodontomys megalotis*), and house mouse (*Mus musculus*) (MNDNR, 2021q).

All eight of the bat species known to occur in Minnesota have the potential to occur within the Project Area (MNDNR, 2021r). These species include the federally threatened northern long-eared bat (NLEB; *Myotis septentrionalis*), three state-listed species of concern (big brown bat [*Eptesicus fuscus*], little brown bat [*Myotis lucifugus*], and tri-colored bat [*Perimyotis subflavus*]), and the hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagan*), eastern red bat (*Lasiurus borealis*), and evening bat (*Nycticeius humeralis*). The eastern red bat, silver haired bat, and hoary bat are migratory species; the others overwinter in Minnesota by hibernating in caves and mines during the winter. Big brown, little brown, silver-haired, eastern red, hoary, and tri-colored bats were recently detected during pre-construction acoustic surveys at the Mower County Wind Project north of the Project (Tetra Tech, 2020).

Northern Long-eared Bat Habitat Assessment

An NLEB habitat assessment was conducted to identify and quantify potentially suitable summer NLEB habitat within 2.5 miles of the original 12,745-acre Project Boundary (the assessment area). This assessment defined potentially suitable NLEB summer habitat as described in the *2020 Range-Wide Indiana Bat Summer Survey Guidelines* (USFWS, 2020c).

Forested areas within the assessment area were assessed via desktop and digitized to achieve high classification precision and accuracy. An experienced bat biologist reviewed the results and evaluated the suitability of each forested patch to ensure all patches deemed suitable were valid and to ensure no forested patches were excluded that could be ecologically important.

Within the assessment area, approximately 2,125 acres of potentially suitable NLEB summer habitat are primarily situated within the riparian areas of the Little Cedar River, Wapsipinicon River, North Branch Upper Iowa River, and their tributaries (Figure 1 in Appendix I). However, only 2.0 acres of potentially suitable NLEB summer habitat are located within the current 5,258-acre Project Area; this acreage includes two small riparian patches located east of the Little Cedar River on the western and northwestern edges of the Project Area.

General Bat Acoustic Surveys

Seasonal bat activity levels at the Project were monitored from April 16, 2021 to October 20, 2021 using two acoustic bat detectors. One detector was positioned between crop fields in an agricultural area similar to the areas where turbines have been sited; this detector was intended to be representative of future turbine placement (representative station). A second detector was located north of the existing Rose Wind turbines in an area containing forest and water sources considered attractive to bats. This detector was intended to gather a more representative sampling of the bat species composition within the Project Area (bat feature station). Detectors were set to record daily from one half-hour prior to sunset until one half-hour after sunrise. The microphones deployed at the two chosen locations were elevated 1.5 m off the ground; due to the lack of meteorological towers at the Project, no raised microphones set at or above the rotor-swept zone were included in the study design. MNDNR and MNDOC approved this survey methodology on February 25, 2021 and March 3, 2021, respectively (see Appendix A).

Reptiles and Amphibians

According to the MNDNR, 49 reptile and amphibian species have the potential to occur in Minnesota (MNDNR, 2021s). Based on heavy agricultural use within the Project Area, reptile and amphibian species are likely limited to those that are common, widespread, and resilient to agricultural and human disturbance. Reptile and amphibian species that potentially occur within the Project Area include American toad (*Anaxyrus americanus*), green frog (*Lithobates clamitans*), boreal chorus frog (*Pseudacris maculata*), northern leopard frog (*Lithobates pipiens*), painted turtle (*Chrysemys picta*), snapping turtle (*Chelydra serpentina*), common garter snake (*Thamnophis sirtalis*), and plains garter snake (*Thamnophis radix*) (MNDNR, 2021s). Most of these species occur in habitats adjacent to wetlands, streams, ditches, or ephemeral ponds; however, some of these species (e.g., northern leopard frog, garter snakes) are often observed in open areas, including fallow agricultural fields.

Recorded bat activity was significantly higher at the bat feature station (98.35 ± 14.15 bat passes per detector-night) than the representative station (6.37 ± 0.73 bat passes per detector-night). Mean bat activity was higher in the summer (May 16 to July 31) at representative (8.90 ± 1.63) and bat feature stations (224.82 ± 30.24), followed by fall (August 1 to October 20; 6.04 ± 0.82 and 39.98 ± 3.62, respectively), and lowest in the spring (April 16 to May 15; 2.00 ± 0.48 and 24.29 ± 7.88, respectively). At the representative station, summer activity increased starting in early July and peaked in late July. Bat activity remained elevated until mid-September. The number of bat passes per detector-night provides an index of bat activity; however, pass rate data do not represent individual bats and cannot be used to estimate population size. Bat activity was recorded during the entirety of the monitoring period.

Call files containing bat activity were identified to the species level using the Bats of North America Classifier 5.4.0 in Kaleidoscope Pro Version 5.4.0 (Kaleidoscope; Wildlife Acoustics, Maynard, Massachusetts). Kaleidoscope identified calls for eight species within the Project Site. Hoary bats and silver-haired bats were the primary species recorded, present on 83% and 79% of all calendar nights, respectively, followed by big brown bats on 77% of calendar nights. Other species that Kaleidoscope commonly identified calls for included little brown bat (73%), eastern red bat (53%), evening bat (39%), and tri-colored bat (30%). Little brown bats, tri-colored bats, and big brown bats are state-listed as Minnesota SPC.

Possible NLEB calls were identified by Kaleidoscope Pro on 9% of all calendar nights at the bat feature station. However, none of the 21 bat calls Kaleidoscope classified as potential NLEB were confirmed during manual vetting and all were reclassified.

A report describing the results of acoustic bat surveys will be submitted to the MNDNR and MNDOC in the first quarter of 2022.Migratory Waterfowl Feeding and Resting Areas

The MNDNR has designated 38 MWFRAs in 25 counties across the state (MNDNR, 2016d). These designated areas protect waterfowl from disturbance by either restricting watercraft motor size (e.g., trolling motors only) or prohibiting motorized watercraft during the open waterfowl hunting season. No MWFRAs are located in the Project Area (MNDNR, 2016d). Upper Twin Lake, the nearest MWFRA, is approximately 34 miles west of the Project Site in Freeborn County.

Important Bird Areas

Important Bird Areas (IBAs) are administered and designated by the National Audubon Society based on their regional or global significance for birds. IBAs often provide important habitat for specific life stages for rare birds, important migration stopover habitat, or known congregation areas; however, they have no legal or protected status.

No IBAs are located within the Project Area (National Audubon Society, 2021b). Two small state-priority IBAs are located south of the Project Site, in Iowa: Hayden Prairie State Preserve is located approximately 16 miles southeast of the Project Site and Elk Creek Marsh is located approximately 30 miles southwest of the Project Site. In Minnesota, the nearest IBA is Blufflands-Root River IBA located along the Root River in Houston and Fillmore Counties (approximately 18 miles east of the Project Site).

8.20.2 Potential Impacts

Ground-disturbing construction activities can reduce, alter, or fragment wildlife habitats, which may affect local wildlife species. Increased edge exposure and reduced habitat availability can cause behavioral avoidance of previously suitable habitat areas in some species and may increase predation (mortality) rates or reduce feeding or breeding success in others. Rose Creek sited the Project to minimize indirect impacts to wildlife species, including birds and bats, by placing turbines and other Project infrastructure primarily within previously disturbed agricultural areas; avoiding wetlands, waterbodies, and naturally vegetated areas, including forests and potential prairies; and using developed road systems to the extent possible. Post-construction restoration will occur in temporarily disturbed areas, reducing the length of time until affected wildlife habitats are revegetated. BMPs will be implemented during Project construction, operation, and decommissioning to minimize the extent of vegetation removal and indirect impacts to wetlands and waterbodies.

Sound and increased vehicle traffic generated during construction, operation, and decommissioning can alter species feeding and breeding behaviors, and may cause wildlife to avoid the Project Area. Temporary increases in intermittent sound, traffic, and human activity will be primarily limited to the duration of construction (approximately 3 to 6 months) and site decommissioning (approximately 3 months) and are not expected to cause permanent site avoidance by wildlife species. Background turbine noise and movement during Project operations are not expected to differ significantly from the current Rose Wind Project conditions; potential

bird and bat behavioral responses to Project operation are discussed below in Sections 8.20.2.1 and 8.20.2.2.

The Rose Wind Project is currently operational and is directly adjacent to the Adams Wind Project. Wind facilities are prevalent throughout southern Minnesota and northern Iowa (see Section 9.2).

The Project will not require overhead power lines and will not install meteorological towers, thus the primary wildlife concern associated with operation of the Project turbines is direct bird and bat collision and mortality. Mortality risks are typically highest during the spring and fall migratory periods for birds and the fall migratory period for bats. Vehicle speed limits will be imposed to reduce potential for wildlife collisions and to avoid attracting eagles and other scavengers (e.g., raptors) to the Project Area. In addition, to minimize Project bat fatalities, the Project has also committed to feathering turbine blades up to manufacturer's cut-in speeds from one-half hour before sunset to one-half hour after sunrise during the fall migration season from mid-July to mid-October, in accordance with guidance from the American Wind Energy Association.

Though bird and bat collisions are expected during the Project's operational life, wind turbines have been operating in the Project Area since 2003, and, as described above, are prevalent in the regional landscape. As a part of the repower, the number of Project turbines will be reduced from 11 to six or seven turbines. Though the overall nameplate capacity of the Project will remain at up to 17.4 MW, the proposed turbines will be larger both in size and in MW and are collectively expected to produce more electricity (up to the nameplate capacity) than the existing Rose Wind Project turbines. Analysis of hundreds of publicly available studies have not shown a strong correlation between bird or bat fatality rates and turbine size (WEST 2019, Newman et al. 2020), though a recent study conducted by the USGS found that the relative amount of energy produced (i.e., MW hours) may be a better predictor of bird and bat fatality rates (Huso et al. 2021). Bird and bat fatality rates at the Project may increase due to the higher cumulative energy output; however, this increase is expected to be negligible due to the small size of the Project and reduced number of turbines.

The list below provides a high-level summary of conservation measures that Rose Creek will incorporate during the siting, design, construction, operation, and decommissioning of the proposed Project. These measures are based on the USFWS WEG and ECPG, LWECS Site Permit application guidance, and industry BMPs, and are intended to provide a practical means to reduce potential impacts to wildlife and sensitive habitats. For a more detailed discussion of the conservation measures already applied during Project siting and design, as well as those that will be implemented during Project construction, operation, and decommissioning, please see the Project BBCS, and Decommissioning Plan (Appendix J and L, respectively).

- Rose Creek developed and will implement a BBCS (see Appendix J). The BBCS describes Rose Creek's approach to avoid and/or minimize potential impacts to birds and bats that may result constructing and operating the Project. The BBCS adheres to recommendations in the USFWS WEG and ECPG, as well as Minnesota's WEG.

- Where possible, Project infrastructure was sited to avoid non-agricultural vegetation to the extent practicable.

- Rose Creek will implement BMPs during Project construction, operation, and decommissioning to minimize the extent of vegetation removal and indirect impacts to potential wildlife habitats, including wetlands and waterbodies.

- Rose Creek will restore temporarily disturbed non-cultivated workspace areas after construction to reduce the length of time until affected wildlife habitats are revegetated.

- Vehicle speed limits of 25 mi per hour will be implemented on all Project access roads to reduce potential for wildlife collisions.

- Rose Creek will minimize Project bat fatalities by feathering turbine blades up to manufacturer's cut-in speeds from one-half hour before sunset to one-half hour after sunrise between mid-July and mid-October, in accordance with American Wind Energy Association guidance.

- Rose Creek has committed to avoiding tree felling between April 1 and September 10 to reduce potential construction impacts to migratory birds and to avoid unanticipated disturbances to tree-roosting bats during the majority of their active season.

- Rose Creek will hire a third party to conduct one year of standardized post-construction monitoring (PCM) surveys to evaluate bird and bat fatalities during Project operations. The PCM survey approach will address Tier 4 of the WEG (USFWS 2012) and adhere to the guidance provided in the MNDNR and DOC-EERA's *Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota* (Mixon et al. 2014). For more information on PCM surveys, see Section 5 of the BBCS (Appendix J).

- Rose Creek developed and will adhere to a Decommissioning Plan to ensure construction BMPs and applicable potential wildlife habitat avoidance and minimization measures are followed at the end of the Project's operational life (see Appendix L).

Birds

The Project is located in the Mississippi Flyway migration corridor (National Audubon Society, 2021c) and within the Eastern Tallgrass Prairie Bird Conservation Region (Birds Studies Canada and North American Bird Conservation Initiative, 2014), which historically contained an abundance of grassland and woodland habitats suitable for migratory birds. However, very few open water sources, including streams, lakes, and wetlands, and no county, state, or federally protected lands that may contain suitable bird habitats are located within the Project Area.

The abundant crop fields within the Project Area may provide foraging and migrating stopover habitat, but the agricultural landscape offers limited habitat to support breeding bird populations (USGS, 2020; BWSR, 2019). The presence of wind turbines may result in the loss or fragmentation of raptor habitat (Watson et al., 2018) and may lead to the abandonment of raptor nesting territories (Dahl et al., 2012) or reduce nest success and post-fledging survival (Kolar and Bechard, 2016). Some studies have suggested that operating turbines may lead to reduced abundance of waterfowl (Osborn et al., 1998; Johnson et al., 2000), whereas other studies have found the presence of operating turbines to have no effect (USFWS, 2009). The existing 11-turbine Rose Wind Project represents less than 3% of the turbines within a 10-mi-radius of the Project Boundary; thus, decommissioning and repowering turbines for the Project is not expected to contribute an appreciable effect on bird migration or stopover habitat use. Species impacts due

to habitat loss, fragmentation, or habitat alteration within the Project Area are expected to be minimal and population-level impacts are not expected.

Publicly available studies at recently constructed (2011 – 2017) wind energy facilities within the Eastern Iowa and Minnesota Drift Plains Level IV Ecoregion were reviewed to assess potential direct impacts to birds within the Project Area. Estimated fatality rates at other projects in the ecoregion ranged from 0.51 to 8.44 bird fatalities per MW per study period (WEST, 2019). Among these wind energy facilities, Pleasant Valley, located approximately 9.3 miles north of the Project, is the closest facility with available bird fatality rates and lies within an agricultural landscape similar to the Project. The estimated bird fatality rate at Pleasant Valley during 2016 – 2017 was 0.68 birds per MW (Tetra Tech, 2017). During migration, birds typically fly at higher altitudes (Ehlrich et al., 1988; Butler, 2016) and in theory may be at lower risk for collision with turbines.

Publicly available fatality counts and species lists for wind energy facilities within the Eastern Iowa and Minnesota Drift Plains Level IV Ecoregion were also reviewed to determine the potential collision risk for sensitive species. No eagles, state-listed threatened or endangered species, or federally listed species have been documented during formal PCM studies between 2011 and 2017 in this ecoregion. Two state-listed species of concern, short-eared owl and purple martin, have been found as PCM study fatalities in the region; however, these occurrences were rare (two fatalities each) and SPC bird species do not appear to be at high risk of collision at wind projects in the region (WEST, 2019).

The Project Area is dominated by agriculture and all turbines will be placed in cultivated fields. In addition, no Project turbines have been sited within two miles of known eagle nests. Rose Creek has also committed to avoiding tree felling between April 1 and September 10 to avoid impacts to migratory birds. Based on the low availability of natural habitats in the Project Area and given the similarities between the agricultural landscapes in the Project and nearby wind energy facilities, post-construction bird fatality rates and the collision risk for sensitive bird species at the Project are expected to be comparable to other wind energy facilities in the region. Rose Creek has also committed to avoiding tree felling between April 1 and September 10, as recommended by the USFWS, to reduce potential construction impacts to migratory birds (USFWS, 2008).

Bats

Impacts to bats at wind energy facilities are mostly caused by direct mortality, but indirect impacts such as habitat loss and behavioral changes such as area avoidance may also occur. If bats are roosting nearby, loud noises such as those associated with agricultural or construction activities, may initially cause them to startle, leave a day-roost, or temporarily avoid the Project Area, depending on the noise distance and volume. However, *Myotis* bat species have been shown to acclimatize to regular noise, including both intermittent noises from sources such as airports and train horns, and more continuous sounds, including traffic noise (USFWS, 2016).

The removal of trees may also affect any bats using these habitats for roosting. Forested habitat, including suitable NLEB summer habitat, is minimal within the Project Area, and all proposed turbines have been sited more than 1,000 ft from suitable summer NLEB roosting and foraging habitat. Rose Creek has committed to avoiding tree felling between June 1 and July 31, which will reduce potential construction impacts to tree-roosting bats during their active season. These measures will reduce direct and indirect impacts to foraging and roosting bats within the Project Area. As discussed elsewhere, Rose Creek has also committed to avoiding tree felling between April 1 and September 10 to reduce potential construction impacts to migratory birds.

Estimated fatality rates at other projects in the ecoregion ranged from 1.8 to 12.55 bats fatalities per MW per study period (WEST, 2019). Among these wind energy facilities, the Pioneer Prairie II Wind Project, located 0.3 mile south of the Project, is the closest facility with available bat fatality rates, and lies within an agricultural landscape similar to the Project. The estimated bat fatality rate at Pioneer Prairie II was 10.06 bats per MW during 2011 – 2012 and was 9.83 bats per MW during 2013 (Chodacheck et al., 2012, 2014b; MidAmerican Energy Company, 2018).

Hoary, silver-haired, and eastern red bats are the three most frequently observed bat species fatalities at wind projects in the Midwest, comprising 86% of publicly reported bat fatalities between 2011 and 2018 (WEST, 2019). No state-listed endangered or threatened or federally listed bat species have been documented as PCM study fatalities in this ecoregion; however, three state-listed species of concern, the big brown bat, little brown bat, and tri-colored bat, have been recently reported as wind project fatalities in southeastern Minnesota and northeastern Iowa (WEST, 2019; BCI, 2021). Big brown bats and little brown bats were the most common sensitive species found as fatalities.

The Project Area is dominated by agriculture and all turbines will be placed in cultivated fields. Based on the low availability of natural habitats in the Project Area and given the similarities between the agricultural landscapes in the Project and nearby wind energy facilities, post-construction bat fatality rates and the collision risk for sensitive bat species at the Project are expected to be comparable to other wind energy facilities in the region.

8.20.3 Mitigation Measures

Rose Creek has followed the WEG's tiered approach to reduce potential impacts to birds, bats, and sensitive habitats during the Project siting and design process, and will implement numerous conservation measures during Project construction, operation, and decommissioning to further avoid and minimize potential Project affects to wildlife species, as described in the BBCS and Decommissioning Plan. Based on these planned voluntary measures, Rose Creek anticipates that additional Project mitigation measures are not necessary.

8.21 RARE AND UNIQUE NATURAL RESOURCES

The Project Area was evaluated for the potential presence of rare and unique natural features through a desktop review of online databases including the USFWS Information for Planning and Conservation (IPaC) and the MNDNR NHIS. A one-mile (1.61 km) buffer was applied and reviewed for potential occurrences of rare and unique features. While the entire Project is located in Mower County, Minnesota, the one-mile (1.61 km) buffer extends into Mitchell County, Iowa. No infrastructure will be located in Iowa.

Merjent, Inc. (Merjent) prepared a Tier 1 and 2 Report (Appendix G) in accordance with the 2012 Land-Based Wind Energy Guidelines (USFWS, 2012), which correspond to stages 1 and 2 of the 2013 Eagle Conservation Plan Guidance (USFWS, 2013), and the Indiana Bat Range-Wide Summer Survey Guidelines (which also includes recommendations relevant to NLEB (*Myotis septentrionalis*) Phase 1 initial project screening (USFWS, 2020a).

8.21.1 Existing Resources

Federally Listed Species

Merjent consulted information from the USFWS' IPaC tool to determine the potential presence of listed species (USFWS, 2021a). Results are provided in Table 8.21.1-1 below as well as species accounts and an analysis of potential impacts.

TABLE 8.21.1-1

Federally Listed Species Potentially Present in the Project Area

Scientific Name	Common Name	Status
Myotis septentrionalis	Northern long-eared bat	Threatened
Lespedeza leptostachya	Prairie bush clover	Threatened

Northern long-eared bat

The NLEB is a temperate, insectivorous, migratory bat that hibernates in mines and caves in the winter and spends summers in wooded areas. The key stages in the annual cycle of NLEBs are: hibernation, spring staging and migration, pregnancy, lactation, volancy/weaning, fall migration, and swarming. While varying with weather and latitude, generally NLEBs will typically hibernate between mid-fall through mid-spring each year. The spring migration period likely runs from mid-March to mid-May. Females depart shortly after emerging and are pregnant when they reach their summer area. Birth of young occurs between mid-June and early July and then nursing continues until weaning, which is shortly after young become volant in mid- to late July. Fall migration likely occurs between mid-August and mid-October (USFWS, 2021b).

The NLEB was listed as a federally threatened species in May 2015, with an interim 4(d) rule; effective February 16, 2016, the USFWS finalized the 4(d) rule. A 4(d) rule may only be applied to species listed as threatened, and is a tool periodically utilized by the USFWS to allow for flexibility in Endangered Species Act implementation. The rule allows the USFWS to tailor take restrictions to those that make the most sense for protecting and managing at-risk species and directs the USFWS to issue regulations considered "necessary and advisable to provide for the conservation of threatened species" (USFWS, 2020b).

In January 2020, the D.C. District Court found that the USFWS decision to list the species as threatened was arbitrary and capricious. The threatened listing has been remanded back to the USFWS for determination; in the meantime, the listing determination and 4(d) rule have not been vacated.

Incidental take of NLEBs is not prohibited under the 4(d) rule for the species provided project activities are not conducted within 0.25 mile (0.4 km) of known hibernacula and do not remove known roost trees or trees within 150 ft (45.72 m) of known roosts.

Merjent reviewed the MNDNR and USFWS Townships Containing Documented NLEB Maternity Roost Trees and/or Hibernacula Entrances in Minnesota (dated June 3, 2020). No known roost trees or hibernacula have been recorded in Mower County (USFWS, 2020b). Suitable hibernacula such as caves or mines have not been documented within the Project Area.

Tree clearing is not currently proposed for the Project. In addition, and as described above, there are no known roost trees or hibernacula within Mower County (USFWS, 2020b).

Landcover within the Project Site is primarily row-crop agriculture; however, stands of trees greater than 3 inches (7.62 cm) diameter at breast height could provide suitable roosting or foraging habitat for NLEBs.

Western EcoSystems Technologies, Inc. (WEST) conducted a habitat assessment for the Project to quantify the amount of potentially suitable NLEB summer habitat located within the Project Site and within a 2.5-mile buffer (WEST, 2021a).

Within the assessment area, approximately 2,125 acres of potentially suitable NLEB summer habitat are primarily situated within the riparian areas of the Little Cedar River, Wapsipinicon River, North Branch Upper Iowa River, and their tributaries. However, only 2.0 acres of potentially suitable NLEB summer habitat are located within the current 5,258-acre Project Site; this acreage includes two small riparian patches located east of the Little Cedar River on the western and northwestern edges of the Project Site.

Prairie bush clover

Prairie bush clover is found only in the tallgrass prairie region of four Midwestern states. It is a member of the bean family and a midwestern "endemic," known only from the tallgrass prairie region of the upper Mississippi River Valley (USFWS, 2020c). Landcover within the Project Site is primarily row crop agriculture; however, any areas of native, unplowed prairie could provide suitable habitat for prairie bush clover. Remnants of native prairie habitat have been known to occur along roadsides, railroad rights-of way, and isolated patches of private land throughout Minnesota, and if present could provide habitat for this species. Based on a desktop review and field observations during wetland delineations, no suitable habitat for Prairie bush clover was identified within the wetland survey area.

Federally Designated Critical Habitat

No federally designated critical habitat, for either species, is present within the Project Area (USFWS, 2021a).

State Listed Species

Merjent, under MNDNR license agreement LA-958, conducted a query of the MNDNR's NHIS to determine if state-listed and rare species have been documented within 1 mile (1.61 km) of the Project Boundary (see Table 8.21.1-2 and Figure 12). Descriptions of these species follows.

TABLE 8.21.1-2

State-Protected and Rare Species Within 1 Mile (1.61 km) of the Project Boundary

Scientific Name	Common Name	Category	State Status
Eryngium yuccifolium	Rattlesnake Master	Plant	Special Concern
Lythrurus umbratilis	Redfin Shiner	Fish	Special Concern
Phenacobius mirabilis	Suckermouth Minnow	Fish	Special Concern
Lasmigona compressa	Creek Heelsplitter	Mussel	Special Concern
Parthenium integrifolium	Wild Quinine	Plant	Endangered
Asclepias sullivantii	Sullivant's Milkweed	Plant	Threatened
Valeriana edulis var. ciliata	Edible Valerian	Plant	Threatened

Redfin shiners and suckermouth minnows

Redfin shiners and suckermouth minnows are restricted to the Cedar, Zumbro, Root, and Upper Iowa River systems in southern Minnesota (MNDNR, 2021h; 2021i). Tributaries to the Cedar River are present within the Project Site; however, they are unlikely to provide suitable habitat since this species is restricted to the Cedar River.

Creek heelsplitter

The creek heelsplitter typically occurs in creeks, small rivers, and the upstream portions of large rivers. Its preferred substrates are sand, fine gravel, and mud (MNDNR, 2021j). They most often colonize areas downstream of riffles in small pools and typically are found in swift currents within water depths ranging from 1-3 ft. The tributaries within the Project Site may provide suitable habitat.

Rattlesnake master

Rattlesnake master is found in mesic prairies in southern Minnesota (MNDNR, 2021k). Soils are usually glacial tills and range from dry to moist. Most commonly, the plant is found on deep mesic loam but occasionally it is also found on well-drained, sand-gravel substrates (MNDNR, 2021k). Based on a desktop review and observations made during the 2021 wetland delineations and habitat review, habitat for the rattlesnake master is not present within the Project's wetland survey area.

Wild Quinine

Wild Quinine was listed as a state-endangered species in 1984, largely due to habitat loss from agricultural activities. The species is typically found in mesic habitats within remnant prairies and savannas. In Minnesota, the only significant populations that currently survive are in remnant prairie strips along railroad rights-of-way. They are highly sensitive to herbicides, cattle grazing, and repeated haying (MNDNR, 2021l). Based on a desktop review and observations made during the 2021 wetland delineations and habitat review, no native railroad prairies, as identified by the MNDNR, are present within the Project Site.

Sullivant's milkweed

Sullivant's milkweed was listed as a threatened species in 1984. In Minnesota, this species is restricted to undisturbed wet and mesic tallgrass prairies; however, it can be found in degraded prairies (MNDNR, 2021m). In Mower County, it is known to occur within the Wild Indigo Prairie SNA.

Merjent conducted a habitat assessment and presence/absence surveys for Sullivant's milkweed in July 2021. The survey area included, but was not limited to, areas of proposed infrastructure. No habitat or Sullivant's milkweed were observed during the field survey.

Edible Valerian

Edible Valerian was listed as a threatened species in 1984, primarily due to habitat loss. This species favors moist, sunny, calcareous habitat, including calcareous fens, wet meadows, and moist prairies. Most of these habitats are located along railroad rights-of-way. In southeastern

Minnesota, the species may occur on thin, rocky soil, and on cliff ledges associated with dry bluff prairies (MNDNR, 2021n).

Merjent conducted a habitat assessment and presence/absence surveys for edible valerian in July 2021. The survey area included, but was not limited to, areas of proposed infrastructure. No habitat or edible valerian were observed during the field survey.

Bald Eagles

Eagles may occur within the Project Area throughout the year. The Project Area lies within the Mississippi Flyway, which is one of the four major migration corridors in North America. Additionally, the Project is within the Prairie Pothole ecoregion, which contains an abundance of native grassland and wetland habitats suitable for migratory birds. The upland areas of the Project consist primarily of agricultural row crops, which do not typically provide suitable nesting or feeding habitat for bald eagles. Trees are associated with farmsteads and are present within the Project Site; they may provide suitable nesting habitat for bald eagles. Bald eagles may nest and breed within the general Project Area and are likely to occur year-round. Based on bald eagle data from the USFWS, one documented eagle nest is located within one mile (1.61 km) of the Project Boundary.

See Section 8.20.1for additional information on bald eagles and bald eagle nests in the Project Area.

Sites of Biodiversity Significance, Native Plant Communities, and Railroad Prairies

A review of the MBS data identified multiple SOBS within 1 mile (1.61 km) of the proposed Project (MNDNR, 2021o). A site's biodiversity significance rank is based on a variety of factors, including the quality (i.e., size and condition) of NPCs within the site, the presence and numbers of rare species populations, and the site's context within the landscape (i.e., whether the site is isolated in a landscape dominated by cropland or developed land, or whether it is contiguous with or close to other areas with intact NPCs). These sites are ranked by grouping and rated within each of the state's ecological classification system subsections. A rank of outstanding is assigned to those sites which contain the largest, most intact functional landscapes, and the best occurrences of the rarest plant and animal species.

NPC are referred to as native habitats or natural communities and are named for the characteristic plant species within them or for characteristic environmental features (MNDNR, 2021p).

In 1997, the MNDNR surveyed active railroad rights-of-way for native prairie remnants. Many native or sensitive plants in Minnesota can be found in native prairie remnants along railroads.

Table 8.21.1-3 summarizes the SOBS identified within 1 mile (1.61 km) of the Project Boundary.

TABLE 8.21.1-3

Sites of Biodiversity Significance Within 1 Mile (1.61 km) of the Project Boundary

Site Name	Biodiversity Significance
Adams 28	Moderate
Adams 16	Below
Adams 10	Moderate
Adams 11	Moderate
Adams 12	Below

TABLE 8.21.1-3

Sites of Biodiversity Significance Within 1 Mile (1.61 km) of the Project Boundary

Site Name	Biodiversity Significance
Lodi 7	Below
Lodi 32	Below
Adams 35	Moderate

No SOBS are located within the Project Site; therefore, impacts on SOBS are not anticipated.

Table 8.21.1-4 summarizes the NPCs identified within 1 mile (1.61 km) of the Project Boundary.

TABLE 8.21.1-4

Native Plant Communities Within 1 Mile (1.61 km) of the Project Boundary

Site Name	Description
FFs59a - Silver Maple - Green Ash - Cottonwood Terrace Forest	Floodplain Forest System
UPs23a - Mesic Prairie (Southern)	Upland Prairie System
MHs38 - Southern Mesic Oak-Basswood Forest	Mesic Hardwood Forest System
WMs83a1 - Seepage Meadow/Carr, Tussock Sedge Subtype	Wet Meadow/Carr System

No NPCs are located within the Project Site; therefore, impacts on NPCs are not anticipated.

No railroad prairies as identified and designated by the MNDNR are located within 1 mile (1.61 km) of the Project Boundary.

8.21.2 Potential Impacts

Federally Listed Species

Northern long-eared bat

Impacts to bats at wind energy facilities are mostly caused by direct mortality, but indirect impacts such as habitat loss and behavioral changes such as area avoidance may also occur. If bats are roosting nearby, loud noises such as those associated with agricultural or construction activities, may initially cause them to startle, leave a day-roost, or temporarily avoid the Project Area, depending on the noise distance and volume. However, *Myotis* bat species have been shown to acclimatize to regular noise, including both intermittent noises from sources such as airports and train horns, and more continuous sounds, including traffic noise (USFWS, 2016).

The removal of trees may also affect any bats using these habitats for roosting. Forested habitat, including suitable NLEB summer habitat, is minimal within the Project Area, and all proposed turbines have been sited more than 1,000 ft from suitable summer NLEB roosting and foraging habitat. Rose Creek has also committed to avoiding tree felling between June 1 and July 31 to avoid unanticipated disturbances to NLEB during the pup season. These measures will reduce direct and indirect impacts to foraging and roosting bats within the Project Area.

The Project Area is dominated by agriculture and all turbines will be placed in cultivated fields. Based on the low availability of natural habitats in the Project Area and given the similarities between the agricultural landscapes in the Project and nearby wind energy facilities, post-construction bat fatality rates and the collision risk for NLEB at the Project are expected to be comparable to other wind energy facilities in the region.

Prairie bush clover

According to Minnesota Wildflowers (2019), the prairie bush-clover is documented within the northwest corner of Mower County. However, due to the predominance of agricultural land and overall lack of suitable habitat within the Project Area, this species is considered unlikely to be present. Furthermore, according to an NHIS data request, there are no documented occurrences of this species within the Project Area; therefore, impacts to this species are not anticipated.

State Listed Species

The Project Site may contain suitable habitat for some state-listed species; however, the Project Area is largely dominated by agricultural land. Project infrastructure has been sited to avoid disturbing undeveloped habitats to reduce potential impacts to state-listed species.

Redfin shiners and suckermouth minnows

Potential habitat for Redfin shiners and suckermouth minnows is present within the Project Area; however, collector lines that cross tributaries to the Cedar River will be bored and access roads that cross tributaries to the Cedar River will not impact the bed or bank of the waterbodies; therefore, impacts to these species are not anticipated.

Creek heelsplitter

Potential habitat for creek heelsplitters may be present within the Project Area; however, collector lines that cross waterbodies will be bored and access roads that cross waterbodies will not impact the bed or bank; therefore, impacts to this species are not anticipated.

Rattlesnake master

Suitable habitat for the rattlesnake master is not located within the wetland survey area, which includes the Project's proposed construction and operation footprint; therefore, impacts to this species are not anticipated.

Wild Quinine

Suitable habitat for the wild quinine may be present in remnant prairies along roadside ditches; however, no suitable habitat was documented within the Project's wetland survey corridor, which includes the Project's proposed construction and operation footprint; therefore, impacts to this species are not anticipated.

Sullivant's milkweed

Merjent conducted a habitat assessment and presence/absence surveys for Sullivant's milkweed in July 2021. The survey area included, but was not limited to, areas of proposed infrastructure. Neither suitable habitat nor individual Sullivant's milkweed plants were observed during the field survey; therefore, impacts are not anticipated.

Edible Valerian

Merjent conducted a habitat assessment and presence/absence surveys for edible valerian in July 2021. The survey area included, but was not limited to, areas of proposed infrastructure.

Neither suitable habitat nor individual edible valerian plants were observed during the field survey; therefore, impacts are not anticipated. Project infrastructure, including access roads, collector lines, and turbines, was sited outside of suitable habitat for the edible valerian.

8.21.3 Mitigation Measures

Rose Creek will continue to design and construct the Project to reduce potential impacts to rare and unique species and will implement numerous conservation measures during project construction, operation, and decommissioning to further avoid and minimize impacts to rare and unique species. Based on these planned voluntary measures, Rose Creek anticipates that additional Project mitigation measures are not necessary.

9.0 SITE CHARACTERIZATION OF WIND RESOURCES

9.1 DESCRIPTION OF RESOURCES

Site characterization of the wind resource within the Project Area was conducted by TrendLine Insights, LLC (Trendline Insights; TrendLine Insights, 2021). The Project does not include the construction or use of any temporary or permanent MET towers and the existing Rose Wind and Adams Wind projects do not include MET towers. Therefore, the Weather Research and Forecasting Model, a state-of-the-art mesoscale numerical weather prediction model was used to model both the macro and micro-scale meteorological processes across the Project Area. The ERA-5 European Centre for Medium-Range Weather Forecasts, a 20-year reanalysis dataset, which combines state-of-the-art physics and an advanced data assimilation technology (synoptic-scale measurement stations, soundings, buoys, etc.) was used as the meteorological input. High resolution terrain, land use, and state-of-the-art modelling and physics provided the base for the wind resource grid derivation and the subsequent energy yield estimates.

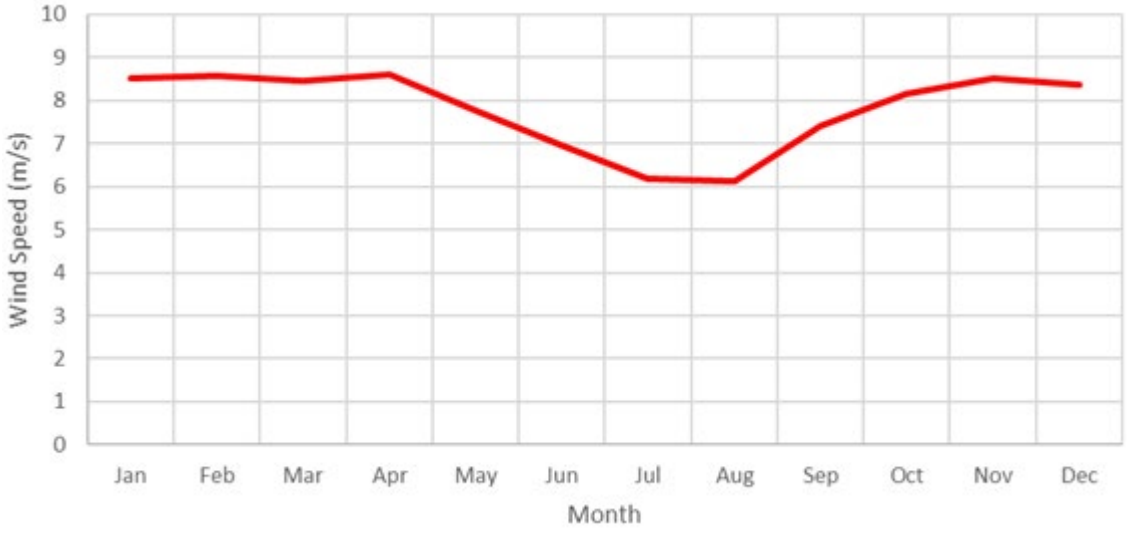
9.1.1 Interannual Variation

Interannual variation is the variation in expected annual wind speeds at a specific location. The interannual variation of the 20-year ERA-5 dataset at the Project Area is 2.178% (TrendLine Insights, 2021).

9.1.2 Seasonal Variation

Seasonal variation is represented by the change in wind resource throughout the year. The Project Area at 80 m (262.47 ft) is characterized with higher wind speeds during the fall, winter, and late spring (October to April; ~> 8.0 m/s [26.25 ft/s]) and significantly lower wind speeds during the early spring and summer (May to September; ~<7.0 m/s [22.97 ft/s]) (Diagram 9.1.2-1) (TrendLine Insights, 2021).

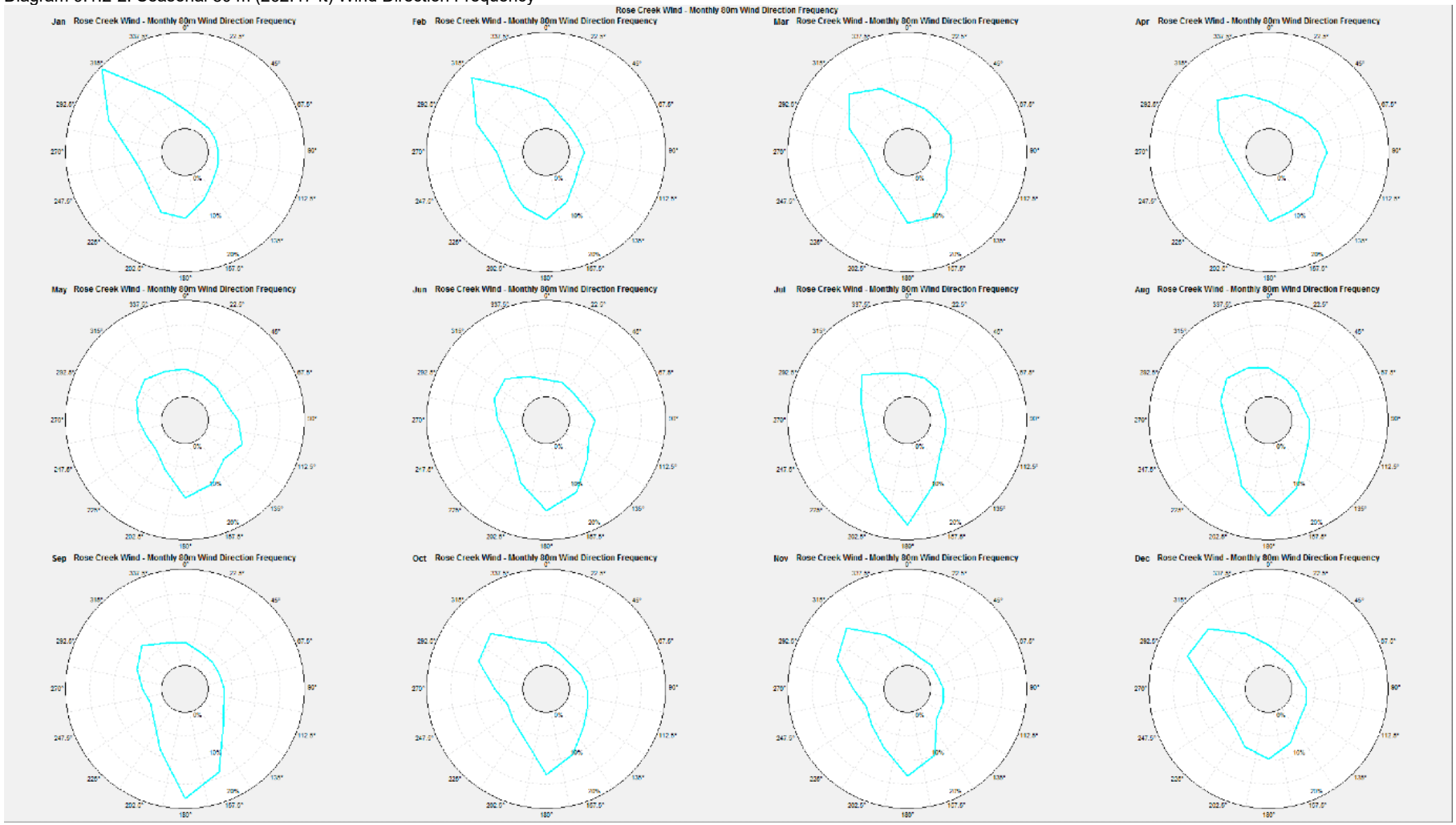
Diagram 9.1.2-1: Seasonal 80 m (262.47 ft) Wind Speed Variation



Source: TrendLine Insights, 2021

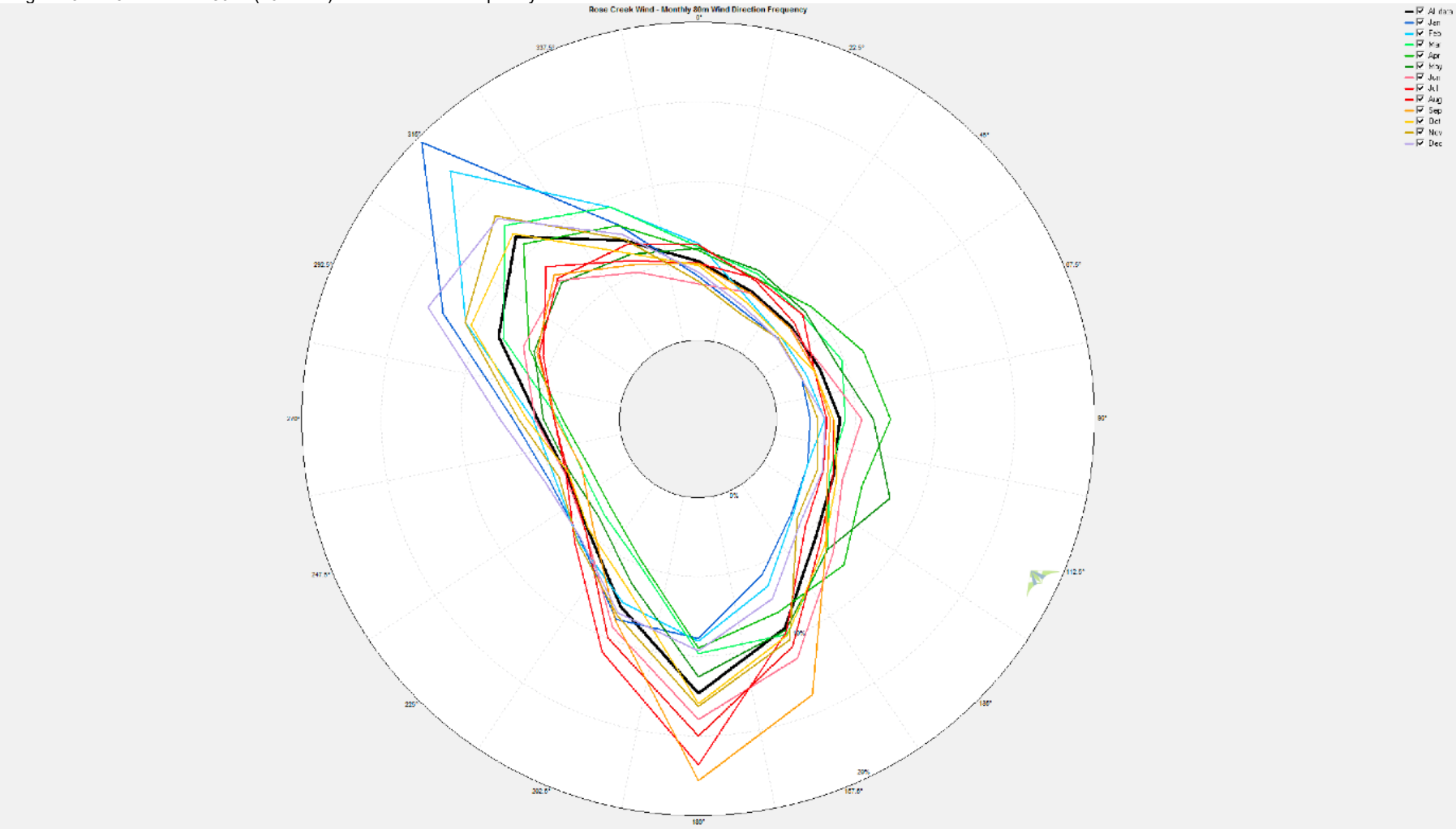
The Project Area is characterized by a distinct bimodal wind direction frequency distribution with prevailing winds coming from the northwest and a secondary lobe from the south (Diagram 9.1.2-2 and Diagram 9.1.2-3). The stronger northwesterly winds occur during the winter and fall months, while the weaker southerly winds occur during the late spring and summer months.

Diagram 9.1.2-2: Seasonal 80 m (262.47 ft) Wind Direction Frequency



Source: TrendLine Insights, 2021

Diagram 9.1.2-3: Seasonal 80 m (262.47 ft) Wind Direction Frequency

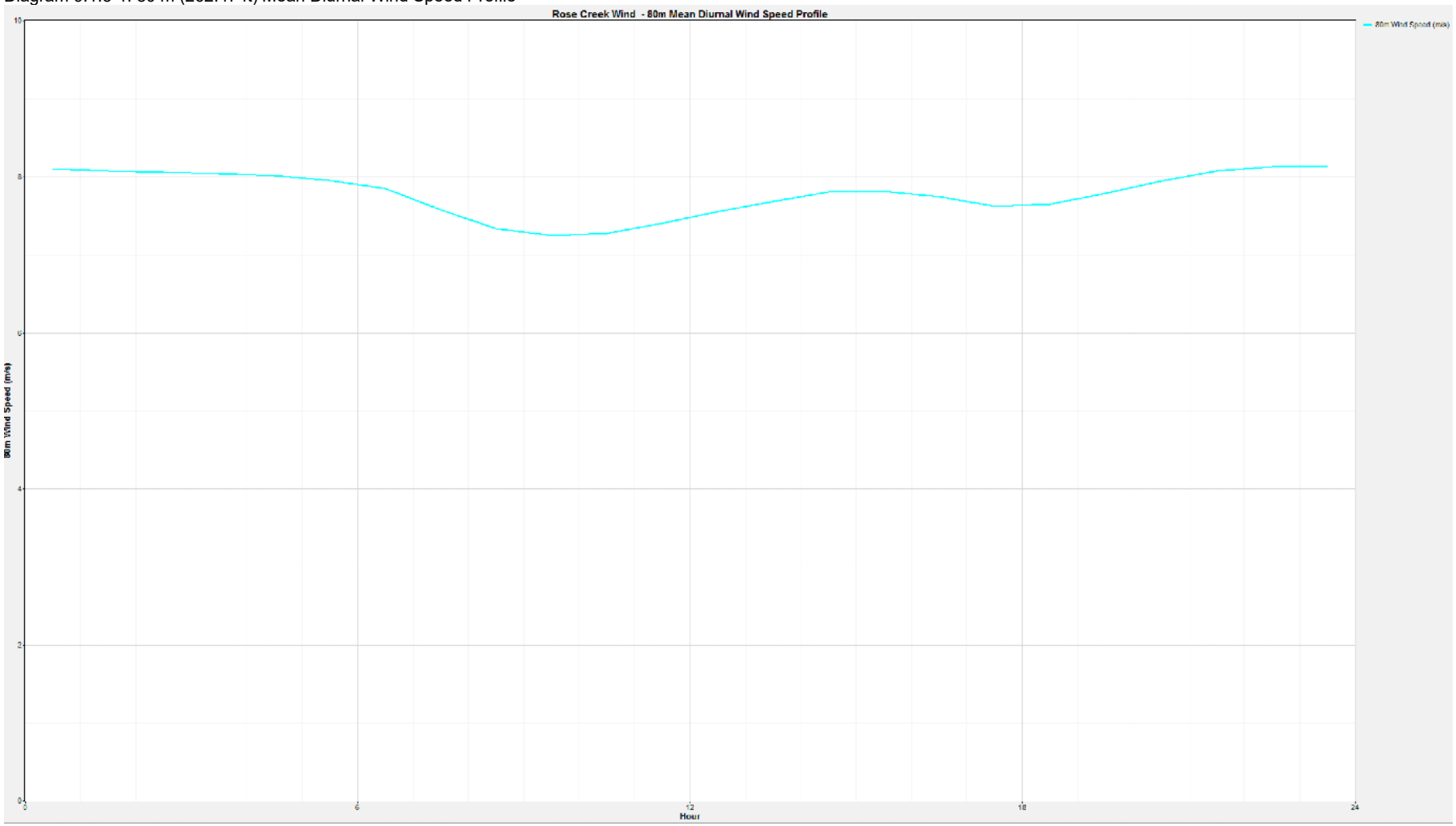


Source: TrendLine Insights, 2021

9.1.3 Diurnal Conditions

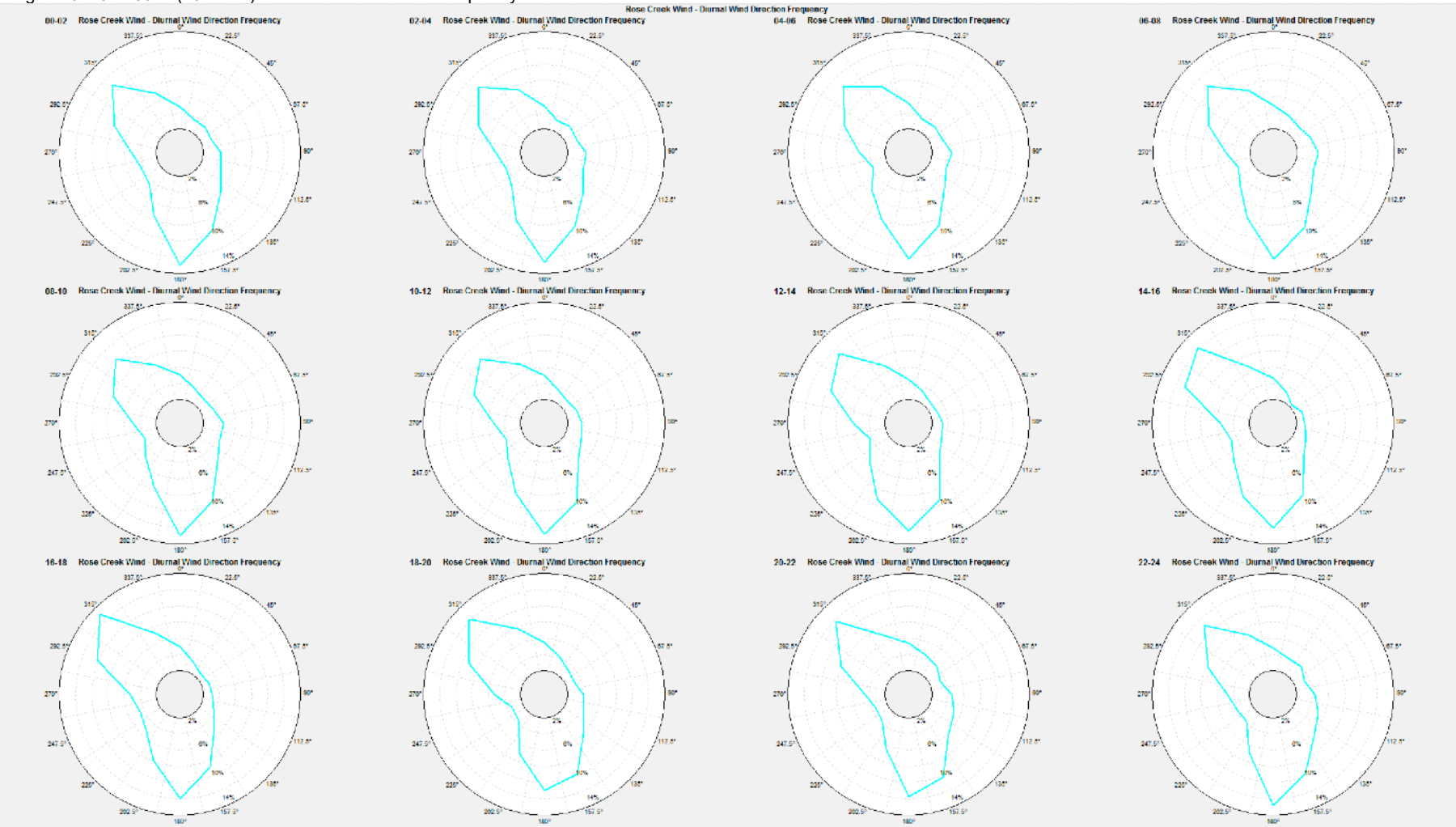
Diurnal variation represents the changes in wind resource throughout the day. The Project Area is characterized by a diurnal wind speed profile that shows elevated wind speeds at night and lower wind speeds during the day (Diagram 9.1.3-1) (TrendLine Insights, 2021). The wind speeds begin to increase just after sunset with the decay of the convective boundary layer and uniform vertical mixing. As the stable nocturnal boundary layer begins to form during the nighttime hours, winds begin to increase as the impact of surface friction is reduced. Near the onset of sunrise, the stable nocturnal boundary layer begins to erode and wind speeds begin to decrease. The Project Area does not see a notable diurnal wind direction signature (Diagram 9.1.3-2).

Diagram 9.1.3-1: 80 m (262.47 ft) Mean Diurnal Wind Speed Profile



Source: TrendLine Insights, 2021

Diagram 9.1.3-2: 80 m (262.47 ft) Diurnal Wind Direction Frequency



Source: TrendLine Insights, 2021

9.1.4 Atmospheric Stability

Atmospheric stability is the ability of the atmosphere to enhance or to resist atmospheric motions. MET tower measurements that measure atmospheric stability are typically representative of the immediate area (e.g., local) and are not representative across a broad area. In the absence of onsite MET measurements, any discussion regarding atmospheric stability is derived from the ERA-5. Modeling atmospheric stability is highly uncertain. The increase in winds modeled during the nighttime hours illustrate the presence of a stable nocturnal boundary layer that allows for a stably stratified flow not impacted by surface friction (TrendLine Insights, 2021).

9.1.5 Turbulence

Turbulence intensity is the measured standard-deviation of wind speed over the mean wind speed for some time period. In the absence of onsite MET measurements, turbulence was estimated using a roughness map (Burton, 2001). Based on surface roughness, the 80 m (262.47 ft) mean turbulence intensity is 0.15 (TrendLine Insights, 2021).

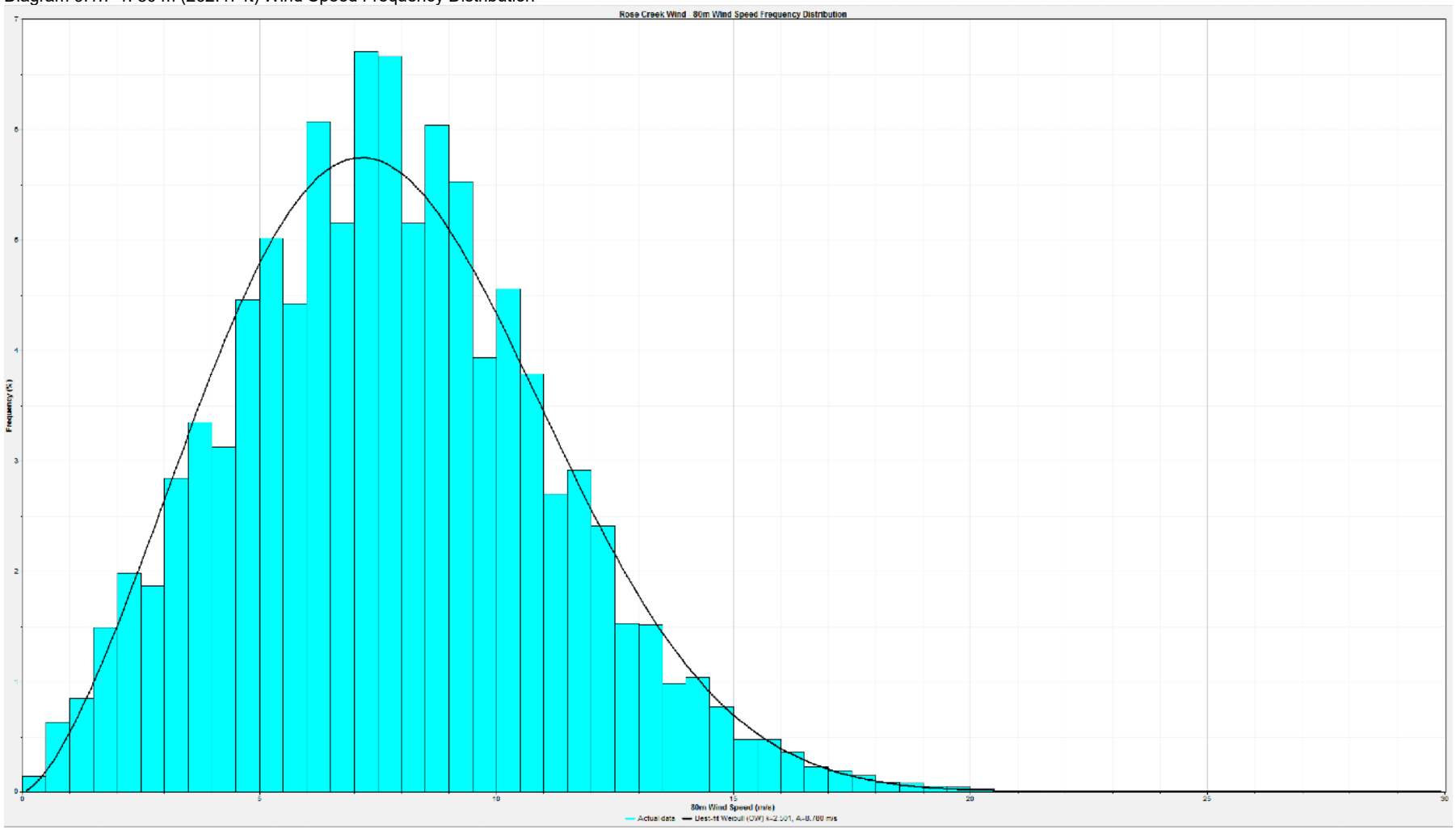
9.1.6 Extreme Conditions

The ERA-5 reanalysis dataset was used to obtain extreme conditions at the Project Area. The 50-year extreme wind speed over 10 minutes at 80 m (262.47 ft) 27.42 m/s (TrendLine Insights, 2021). The maximum temperature at 80 m (262.47 ft) is 33.3 degrees Celsius (91.94 degrees Fahrenheit [°F]) and minimum temperature at 80 m (262.47 ft) is -33.6 degrees Celsius (-28.48 °F).

9.1.7 Speed Frequency Distribution

The 80 m (262.47 ft) wind speed frequency distribution in the Project Area is characterized with a Weibull k value, which is a parameter that reflects the breadth of a distribution of wind speed, of 2.501 and an average wind speed of 8.78 m/s (Diagram 9.1.7-1) (TrendLine Insights, 2021).

Diagram 9.1.7-1: 80 m (262.47 ft) Wind Speed Frequency Distribution



Source: TrendLine Insights, 2021

9.1.8 Variation with Height

Wind shear is the change in wind speeds with increasing elevation. The wind speed and associated shear exponent by height are shown in Table 9.1.8-1 and Table 9.1.8-2.

TABLE 9.1.8-1

Mean Wind Speed by Height

Height	Mean Wind Speed
120 m (393.7 ft)	8.497 m/s (27.88 ft/s)
110 m (360.89 ft)	8.347 m/s (27.39 ft/s)
100 m (328.08 ft)	8.176 m/s (26.82 ft/s)
90 m (295.28 ft)	7.996 m/s (26.23 ft/s)
80 m (262.47 ft)	7.795 m/s (25.57 ft/s)

Source: TrendLine Insights, 2021

TABLE 9.1.8-2

Shear by Height

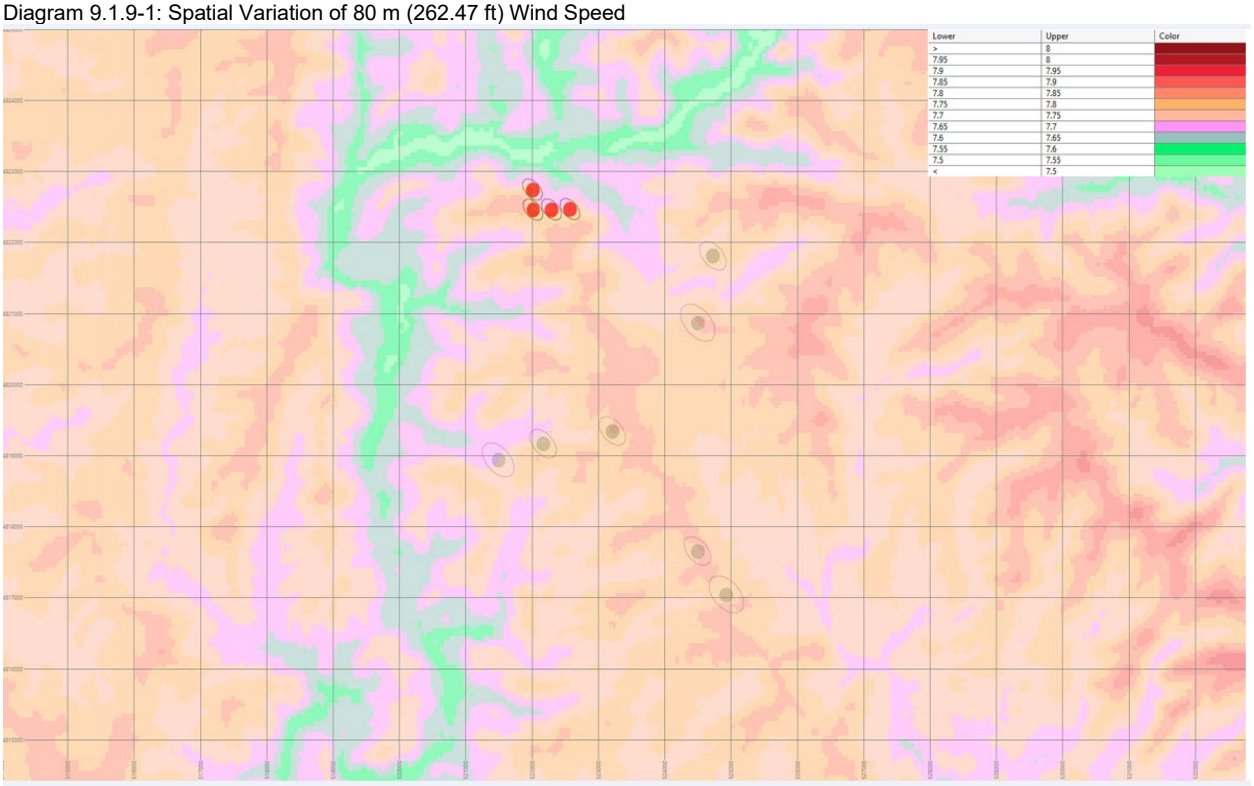
Heights Included	Power Law Exponent
All heights	0.213
120 m (393.7 ft) and 80 m (262.47 ft)	0.213
120 m (393.7 ft) and 110 m (360.89 ft)	0.205
110 m (360.89 ft) and 100 m (328.08 ft)	0.217
100 m (328.08 ft) and 90 m (295.28 ft)	0.212
90 m (295.28 ft) and 80 m (262.47 ft)	0.216

Source: TrendLine Insights, 2021

9.1.9 Spatial Variations

Diagram 9.1.9-1 below shows the 80 m (262.47 ft) wind speed spatial variation of the Project (black) as well as the Adam Wind project (red). The wind resource grid was derived using AWS UL's OpenWind software and the 20-year ERA-5 reanalysis dataset. The warmer colors (oranges and reds) represent higher winds, while the cooler colors (purples and greens) represent lower wind speeds (Diagram 9.1.9-1).

Diagram 9.1.9-1: Spatial Variation of 80 m (262.47 ft) Wind Speed

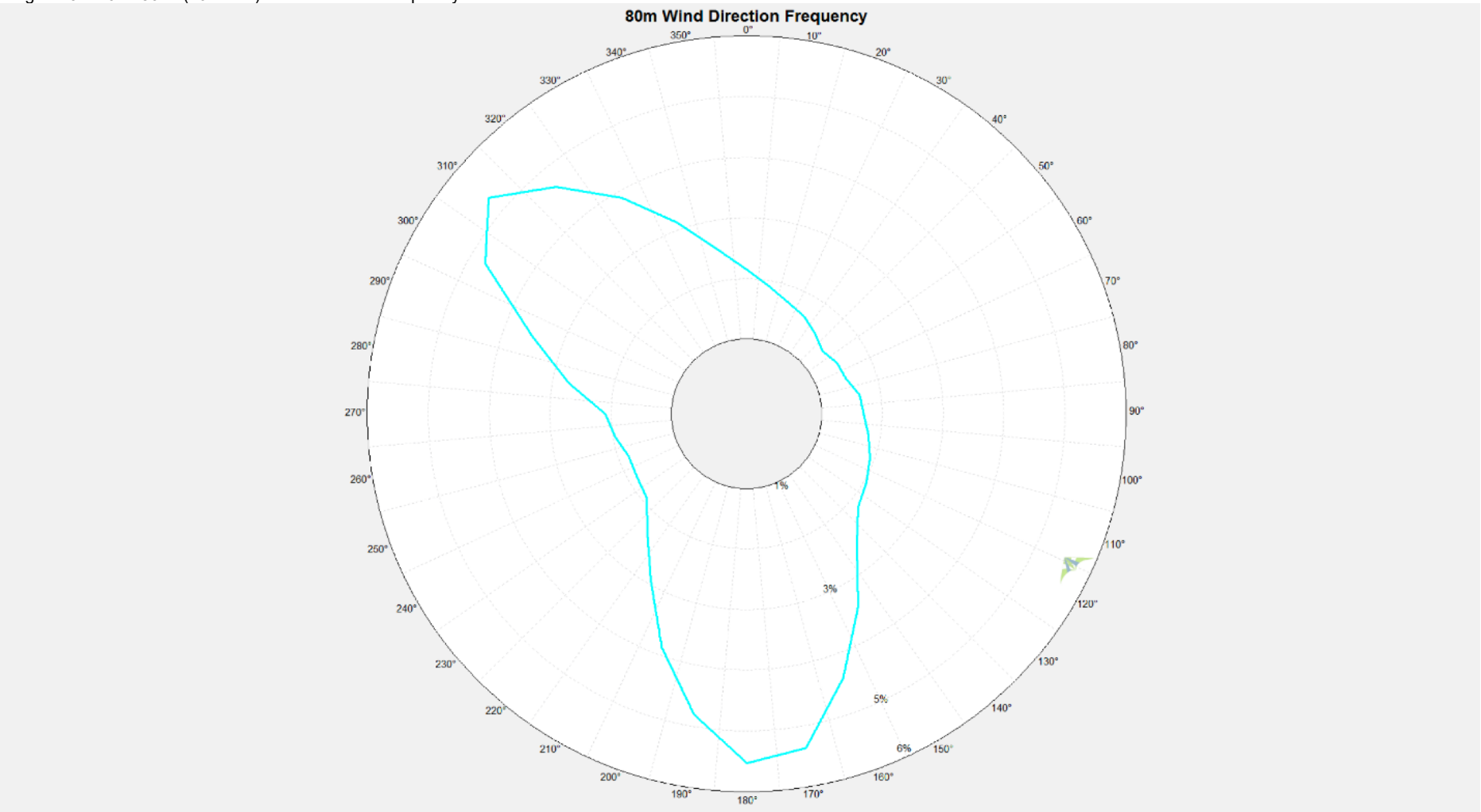


Source: TrendLine Insights, 2021

9.1.10 Wind Rose

A wind rose depicts a circular, graphical representation of wind speed and prevailing wind directions. Diagram 9.1.10-1 below shows the Project ERA-5 Model Output wind rose which is characterized by a distinct bimodal wind direction frequency distribution with prevailing winds coming from the northwest and a secondary lobe from the south. Wind direction frequency data collected at 80 m (262.47 ft) indicates a strong bimodal wind direction distribution with similar prevailing winds northwesterly at 310 degrees during the winter and fall months and southerly at 180 degrees during the late spring and summer months, with 0/360 degrees representing due north.

Diagram 9.1.10-1: 80 m (262.47 ft) Wind Direction Frequency



Source: ECMWF, ERA-5 Model Output

9.1.11 Other Meteorological Conditions

Data including temperature, rainfall, and snowfall from the Grand Meadow meteorological station in Grand Meadow, Minnesota were used to analyze other meteorological conditions near the Project Area. The Grand Meadow station is located approximately 12 miles (19.31 km) northeast of the Project Site and is powered by Agricultural Applied Climate Information Systems and is part of the National Weather Service Cooperative Network. Temperature data over a timeframe of 21 years from 2000-2020 had an average daily mean temperature of 43.3 °F; an average daily maximum temperature of 53.0 °F, with the highest average daily maximum in the month of July at 80.2 °F; and an average daily minimum temperature of 33.6 °F, with the lowest average daily minimum in the month of January at 5.7 °F (AgACIS, 2021). Precipitation data had an average yearly rainfall of 37.29 inches (94.72 centimeters [cm]) and an average yearly snowfall of 52.9 inches (134.37 cm).

In addition, the geographic location of the Project is susceptible to extreme winter storms and icing events. Other extreme weather such as thunderstorms and tornados are possible but tend to be less frequent.

9.2 OTHER WIND TURBINES

Southern Minnesota and northern Iowa have experienced substantial wind energy development. The location of operating wind energy turbines within a 10-mile (16.09-km) extent around the Project Site are shown on Figure 5. In addition to the 11 turbines from the existing Rose Wind Project, the following existing wind farms were identified along with their turbine counts: Adams Wind (4), G McNeilus Wind Farm (9), Crane Creek (12), Grand Meadow (46), Little Cedar (1), Mower County Wind (43), existing Rose Wind (11), Pioneer Prairie I (124), Pioneer Prairie II (58), Pleasant Valley (8), Prairie Star (48), and Turtle Creek (36). A total of 385 turbines are located within a 10-mile (16.09-km) extent of the Project area (see Table 9.2-1 and Figure 5).

TABLE 9.2-1

Turbines within 10 Miles of the Project

Wind Farms	Number of Turbines
Adams Wind	4
Crane Creek	12
Grand Meadow	46
Little Cedar	1
Mower County Wind Energy Center	43
Pioneer Prairie I	124
Pioneer Prairie II	58
Pleasant Valley	8
Prairie Star	48
Turtle Creek	36

10.0 PROJECT CONSTRUCTION

Numerous construction-related activities must be completed prior to the Project's commercial operation. Major construction activities necessary to develop the Project include:

- Ordering all necessary components including towers, nacelles, blades, foundations, and transformers, etc.
- Conducting geotechnical soil borings, testing, and analysis for proper foundation design and materials.
- Developing access roads for construction and maintenance.
- Completing roadway improvements.
- Constructing underground collector lines.
- Installing turbine tower foundations.
- Decommissioning and removal of 11 existing Rose Wind turbines.*
- Installing new towers and turbines.
- Commencing commercial operation.

*Decommissioning of the Rose Wind turbines is not part of this Site Permit Application

Construction will include grading where above-ground infrastructure will be installed, which will include areas for the turbine pads, culverts, access roads, and temporary laydown areas. Up to 56.4 acres may be disturbed during construction; however, not all construction easements will require grading and the actual acreage used is expected to be less.

During grading and excavation, topsoil will be removed, typically to a depth of 8 to 12 inches (20.32 to 30.48 cm), depending on local soil conditions. Topsoil will be stockpiled for use during restoration and reseeding as discussed in Section 10.5.

10.1 ROADS AND INFRASTRUCTURE

Construction of the Project will require the use of existing public state, county, and township roads for the transportation of equipment, construction material, and personnel to and from the Project Site. Temporary public roadway expansions may be required to support the movement of equipment. Roadways may be widened in some locations. Rose Creek will coordinate with appropriate state, county, and township jurisdictions regarding roadway modifications. No permanent asphalt or other paving to existing roadways is anticipated. All temporary roadway modifications will be removed and restored after construction is complete.

During construction, water may be applied to gravel roadways near residences for dust control to abate dust and prevent nuisance conditions. In high traffic areas, it may be determined that the application of chemical dust suppressants, such as calcium chloride, is warranted. In this event, Rose Creek will consult the applicable roadway administrator prior to applying chemical dust suppression measures to ensure compliance with road use agreements.

Following construction, as applicable, public roadway maintenance and repairs will be performed associated with Project activities. BMPs will be implemented to ensure public roadways are kept clear of debris and do not pose hazardous conditions to the public.

10.2 ACCESS ROADS

The Project will require construction of approximately 2.70 miles (4.34 km) of permanent access roads to turbines to support operation of the Project. Existing access roads will be used to the extent possible and the exact location and length of access roads will be determined by the final layout, environmental constraints, and landowner preferences. Access roads will consist of graded soil overlain with geotechnical fabric, as needed, and then covered with gravel. Access roads may incorporate geotechnical fabric and cement stabilization measures beneath the aggregate roadway cap and will be constructed of all-weather Class 5 gravel or similar material. The access roads will be approximately 16 ft to 18 ft (4.88 m – 5.48 m) wide and constructed with a low profile to allow unimpeded crossing by farm equipment. The typical cross section of access roads will be dependent on terrain, grade, and drainage.

Siting and construction of access roads will be completed in accordance with all applicable local and state regulations. Access roads will be sited in areas with stable soil whenever possible and will include appropriate drainage and culverts. Permits for drainage and culvert installation, if needed, will be obtained prior to installation. Rose Creek will work closely with landowners to locate access roads to minimize land-use disruptions. The installation of access roads may require changes to gates, fences, or other existing landscape modifications. Modifications will be discussed with the landowners and gates and fences will be replaced or reconfigured in coordination with the landowner. Any damages to gates or fences resulting from construction or operation of the Project will promptly be repaired.

After construction, access roads will be regraded, filled, and dressed as needed. Where temporary installations are removed, areas will be graded to natural contours and soil de-compaction and re-seeding will occur as described further in Section 10.5.

10.3 OTHER ASSOCIATED FACILITIES

The Project will not include construction of an O&M facility or a MET tower.

The underground electrical collection system will be installed using trenching equipment to a depth of 50 to 54 inches. A temporary disturbance area of approximately 20 ft will be required. After installation of the collection line the trench will be backfilled and the above ground area restored.

The Project will also require grading of a temporary equipment laydown area of approximately 5-7 acres. The temporary laydown area will serve as a location for parking during construction, office trailers, and storage and staging for materials used in construction. The temporary laydown area will be identified prior to construction and the location will be provided to the PUC when available. The existing substation will requirement new, replacement equipment which will be installed on concrete foundations and consist of a gravel footprint with a chain-link perimeter fence, and an outdoor lighting system. The basic elements of the substation include a control house, transformer, outdoor breaker, relaying equipment, steel support structures, and overhead lightning suppression conductors.

The substation is located on the west side of 660th Avenue (Figure 4). The existing substation will be upgraded with similar new equipment with a slightly larger footprint (see Figure 2B). The final design for the updated substation will be completed prior to Project construction and provided to MPUC as part of the pre-construction site plan. The new substation will be approximately 80' X 125', which is slightly larger than the existing substation (approximately 75' X 100'). The placement of the upgraded substation will be such that no new impacts to wetlands or waterbodies will occur.

10.4 TURBINE SITE LOCATION

The freestanding steel tubular wind turbine towers will be erected on reinforced concrete spread footing foundations or other appropriate foundation. Geotechnical data, turbine loads, and cost considerations will dictate the final design of the foundation at each site. Areas around the turbine are graded so that drainage will flow away from the base of the turbine.

10.5 POST-CONSTRUCTION CLEANUP AND SITE RESTORATION

Following the installation of turbines, temporary access roads will be removed and the area will be restored to pre-construction conditions. State, county, or township roads used as a haul route during construction will be restored to pre-construction conditions, as required in road use agreements with the responsible road authorities.

Areas temporarily disturbed by construction activities will be restored to pre-construction conditions. To the extent possible, excavated soil will be used as backfill to support the construction of access roads. In areas where soil compaction occurred due to construction activities, soils will be decompacted using a chisel plow or deep-bladed ripper.

Restored areas will be monitored to ensure revegetation, except in cultivated fields where active farming will occur. Stormwater BMPs, such as silt fence and straw wattle, will not be removed until at least 70 percent revegetation/regrowth has occurred in accordance with the Project's construction stormwater permit, unless the area is in a tillable agricultural field. In agricultural fields, a temporary cover crop will be planted to minimize soil loss in consultation with the landowner.

10.6 OPERATION OF PROJECT

O&M activities will be consistent with applicable North American Electric Reliability Corporation Reliability Standards. Turbines and the substation are monitored remotely by staff at the operations facility in Pipestone, Minnesota, and the Project will use a SCADA system, which will monitor turbines 24 hours per day, 7 days a week. Faults are reset remotely, when possible, to ensure high turbine availability. Wind technicians are called out on non-resettable faults based on time of day and wind conditions.

Facility maintenance is a combination of scheduled preventative maintenance, in accordance with the manufacturer's specifications, and input from engineers based on turbine performance. On-site service and maintenance activities include routine inspections, preventive maintenance, and unscheduled maintenance and repairs of wind turbines, pad-mount transformers, electrical power network, data communication systems, safety/protection systems, and fiber communications systems. Scheduled maintenance is performed in the summer on low wind days whenever possible to maximize site output during windier days. Spare parts will be stored offsite at a third-party maintenance vendor location.

10.7 COSTS

The capital expenditure for the Project is estimated to be $24 to 36 million. This includes all costs of development, design, and construction. Ongoing O&M costs and administrative costs are estimated to be approximately $700,000 to $1.2 million per year, including landowner land lease and easement payments.

10.8 SCHEDULE

Table 10.8-1 provides a summary of the Project schedule.

TABLE 10.8-1

Project Schedule

Activity	Estimated Completion
Land Acquisition	Q4 2021
Site Permit Order	Q3 2022
Financing	N/A – the Project will be self-financed
Procuring Equipment	Q2 – Q4 2022
Construction	Q3 2022 – Q3 2023
Commercial Operation	Q3 2023

10.9 ENERGY PROJECTIONS

A net capacity factor of approximately 48 percent is expected annually. The projected average annual net output of approximately 73.7 gigawatt hours is anticipated for the Project.

11.0 DECOMMISSIONING AND RESTORATION

Rose Creek will be responsible for decommissioning the Project at the end of its operating life, which is estimated to be 30 years from commercial operation date. Future upgrades, including, for instance, a partial repower of turbine components and blades, could extend the life of the Project beyond the 30-year period. A draft Decommissioning Plan, prepared in accordance with the requirements of Minnesota Rule 7854.0500, subpart 13 and DOC-EERA's Application Guidance for Site Permitting of LWECS in Minnesota, is included as Appendix L. The plan will be updated as needed based on comments received during the permitting process, and a final plan will be submitted to the MPUC prior to construction. Table 11-1 presents the DOC-EERA application guidance for decommissioning and where each requirement is addressed within the draft Decommissioning Plan.

The decommissioning process will include disconnecting the Project from the grid, and dismantling and removing the wind turbine towers, wind turbine generators and nacelles, foundations, and underground collection cables to a depth of 48 inches (121.92 cm) below grade. Access roads will be removed unless requested by the landowner. The turbine blades will be removed and the nacelle and hub will be dismantled and processed at ground level. Turbine towers will be dismantled in sections and moved off site. All components will be transported to the appropriate facility for reconditioning, salvage, and/or disposal. Materials will be salvaged or recycled when possible and economically feasible. If turbines have no salvage value at the time of decommissioning, turbine removal will be completed in a more expeditious manner than described above.

If required, additional access roads to turbines and staging areas will be installed to accommodate cranes, trucks, and other machinery required for the disassembly and removal of the turbines. If needed, temporary crane walks may also be installed between turbines. Temporary access roads and staging areas will be removed once decommissioning is complete, and any decommissioning debris generated will also be disposed of properly.

Following the decommissioning activities, Rose Creek will restore the site as close as practicable to preconstruction conditions in accordance with the landowner land lease agreements. Restoration activities are likely to include:

- Regrade site to pre-construction conditions;
- Prepare soil for seeding and seed disturbed areas or allow the land to revert to agricultural use;
- Install temporary and permanent erosion and sediment control measures; and
- Final site cleanup.

The draft Decommissioning Plan outlines the financial surety Rose Creek will provide and details the protocols for decommissioning and site restoration. The Plan also includes estimated costs for Project decommissioning and restoration activities, including potential salvage values, based on 2021 decommissioning cost and salvage value information.

TABLE 11-1

Decommissioning Plan Site Permit Application Guidance Matrix

Site Permit Application Decommissioning Plan Guidance		Location in the Decommissioning Plan (Appendix L)
11.1	The anticipated life of the project.	2.2
11.2	A description of how the facility will be disconnected from the grid.	4.3
11.3	A detailed description of how the physical components will be removed, transported off-site, and disposed of.	4.5, 4.6
11.4	A description of decommissioning, abandonment, and removal conditions included in landowner lease agreement.	2.1
11.5	Site restoration objectives and a detailed description of how those objectives will be met.	4.7
11.6	A detailed estimate of decommissioning costs.	5.1
11.7	A description of the method and schedule for revising cost estimates.	5.1.1, 6
11.8	A description or plan of decommissioning assurance.	5.2

12.0 IDENTIFICATION OF OTHER POTENTIAL PERMITS

Table 12-1 outlines the federal, state, and local permits or approvals that have been identified as required or potentially required for the construction and operation of the Project.

TABLE 12-1

Potential Permits and Approvals Required for Construction and Operation

Agency	Permit or Approval
Federal	
Federal Aviation Administration	Form 7460-1 Notice of Proposed Construction or Alteration
	Form 7460-2 Notice of Actual Construction or Alteration
Federal Communications Commission	Non-Federally Licensed Microwave Study
Federal Energy Regulatory Commission	Exempt wholesale generator certification
	Market-based rate authorization
U.S. Army Corps of Engineers	Jurisdictional Determination
	Federal Clean Water Act Section 404 (Regional General, Individual, or Nationwide Permit)
U.S. Environmental Protection Agency (Region 5) in coordination with the Minnesota Pollution Control Agency (MPCA)	Spill Prevention, Control, and Countermeasure Plan
U.S. Fish and Wildlife Service	Coordination/consultation for review of threatened or endangered species and bald eagles
State of Minnesota	
Minnesota Public Utilities Commission	Site Permit for Large Wind Energy Conversion System
Minnesota Department of Health	Well and Boring Record
Minnesota Department of Labor and Industry	Electrical Plan Review, Permits, and Inspections
Minnesota Department of Natural Resources	Native Prairie Protection and Management Plan
	Endangered species consultations
	Avian and Bat Protection Plan
	Water Use (Appropriation) Permit
Minnesota Department of Transportation (MnDOT)	Utility Accommodation on Trunk Highway Right of Way Permit
	Oversize/Overweight Permit for State Highways
	Access/Driveway Permit
	Tall Towers Permit
MPCA	Section 401 Water Quality Certification
	National Pollutant Discharge Elimination System MPCA General Stormwater Permit for Construction Activity
	Very Small Quantity Generator License – Hazardous Waste Collection Program
	Aboveground Storage Tank Notification Form, if required.
Minnesota State Historic Preservation Office	Cultural and historic resources review and review of State and National Register of Historic Sites and Archeological Survey
Minnesota Office of the State Archaeologist	Review development plans that may impact state sites or unrecorded burials.
Local	
Mower Soil and Water Conservation District	Local Government Unit Wetland Conservation Act approvals/Exemption
Mower County/Townships	Fire Protection Plan
	Road Use Agreements
	Building Permits
	Moving permits (Oversize and Overweight)
	Driveway permits for access roads
	Township driveway permits
	Utility permits for crossing County Rights-of-way

TABLE 12-1

Potential Permits and Approvals Required for Construction and Operation

Agency	Permit or Approval
Other	
Tribal	Voluntary Coordination

13.0 REFERENCES

Agricultural Applied Climate Information System (AgACIS). 2021. AgACIS for Mower County. Available online at: http://agacis.rcc-acis.org/. Accessed March 2021.

Anfinson, S. 2011. State Archaeologist's Manual for Archaeological Projects in Minnesota. Office of the State Archaeologist, Saint Paul, Minnesota. Current version available online at https://mn.gov/admin/assets/OSAmanual_tcm36-186982.pdf

Birds Studies Canada and North American Bird Conservation Initiative (NABCI). 2014. NABCI Bird Conservation Regions. Published by Bird Studies Canada on behalf of the NABCI. Accessed May 2021. Available online: https://www.birdscanada.org/bird-science/nabci-bird-conservation-regions/

Best Neighborhood. Undated. DSL Internet in Mower County, MN with Speeds, Providers, and Coverage. Available online at: https://bestneighborhood.org/dsl-internet-mower-county-mn/. Accessed March 2021.

Butler, P. J. 2016. The Physiological Basis of Bird Flight. Philosophical Transactions of the Royal Society B 371: 20150384. doi: 10.1098/rstb.2015.0384.

Burton, T., Sharpe, D., Jenkins, N., and Bossanyi, E. (2001). Wind Energy Handbook. Chichester: Wiley.

BWSR. 2019. Reinvest in Minnesota (RIM) Overview. Available online at: http://bwsr.state.mn.us/reinvest-minnesota-overview. Accessed March 2021.

Chodachek, K., C. Derby, M. Sonnenberg, and T. Thorn. 2012. Post-Construction Fatality Surveys for the Pioneer Prairie Wind Farm I LLC Phase II, Mitchell County, Iowa: April 4, 2011 – March 31, 2012. Prepared for EDP Renewables, North America LLC, Houston, Texas. Prepared by Western EcoSystems Technology, Inc. (WEST), Bismarck, North Dakota. August 27, 2012.

Chodachek, K., C. Derby, K. Adachi, and T. Thorn. 2014. Post-Construction Fatality Surveys for the Pioneer Prairie II Wind Energy Facility, Mitchell County, Iowa. Final Report: July 1 - October 18, 2013. Prepared for EDP Renewables, North America LLC, Houston, Texas. Prepared by Western EcoSystems Technology, Inc. (WEST), Bismarck, North Dakota. April 2014.

Dahl, E. L., K. Bevanger, T. Nygard, E. Roskaft, and B. G. Stokke. 2012. Reduced Breeding Success in White-Tailed Eagles at Smøla Windfarm, Western Norway, Is Caused by Mortality and Displacement. Biological Conservation 145(1): 79-85. doi: 10.1016/j.biocon.2011.10.012.

Data USA. 2021. Mower County, MN. Available online at: https://datausa.io/profile/geo/mower-county-mn#economy. Accessed May 2021.

DOC-EERA. 2019. Application Guidance for Site Permitting of Large Wind Energy Conversion Systems in Minnesota.

eBird. 2021. eBird. Cornell Lab of Ornithology. Available online: https://ebird.org/home.

Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1988. Essay: How Fast and High Do Birds Fly? In: The Birder's Handbook. Simon & Schuster, New York.

EPA. 2021b. Cleanups in My Community. Available online at: https://ofmpub.epa.gov/apex/cimc/f?p=cimc:map::::71. Accessed February 2021.

EPA. 2021a. Environmental Justice. Available online at: https://www.epa.gov/environmentaljustice. Accessed March 2021.

FSA. 2021a. Conservation Reserve Program. Available online at: https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/. Accessed March 2021.

FSA. 2021b. Conservation Reserve Enhancement Program. Available online at: https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-enhancement/index. Accessed March 2021.

Hoen, B.D., Diffendorfer, J.E., Rand, J.T., Kramer, L.A., Garrity, C.P., and Hunt, H.E., 2018, United States Wind Turbine Database (V3.3, January 14, 2021): U.S. Geological Survey, American Clean Power Association, and Lawrence Berkeley National Laboratory data release, https://doi.org/10.5066/F7TX3DN0.

Iowa Department of Natural Resources. 2021. Iowa Geospatial Data. Available online at: https://geodata.iowa.gov/. Accessed February 2021.

Johnson, G. D., W. P. Erickson, M. D. Strickland, M. F. Shepherd, and D. A. Shepherd. 2000. Final Report: Avian Monitoring Studies at the Buffalo Ridge Wind Resource Area, Minnesota: Results of a 4-Year Study. Final report prepared for Northern States Power Company, Minneapolis, Minnesota, by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming. September 22, 2000. 212 pp.

Kolar, P. S. and M. J. Bechard. 2016. Wind Energy, Nest Success, and Post-Fledging Survival of Buteo Hawks. Journal of Wildlife Management 80(7): 1242-1255. doi: 10.1002/jwmg.21125.

MDA. 2021. What's in my Neighborhood. Available online at: https://app.gisdata.mn.gov/mda-agchem/. Accessed August 2021.

MDH. 2021. Minnesota Well Index. Available online at: https://mnwellindex.web.health.state.mn.us. Accessed April 2021.

Minnesota Geological Survey. 1998. C-11 Geologic Atlas of Mower County [Part A], Plates 2 through 6. Available online at https://conservancy.umn.edu/handle/11299/58549. Accessed March 2021.

MidAmerican Energy Company. 2018. Appendix D - Take Estimation Methods. December 12, 2018. In: MidAmerican Energy Company. 2019. Final Habitat Conservation Plan: MidAmerican Energy Company Iowa Wind Energy Project Portfolio. MidAmerican Energy Company, Des Moines, Iowa. April 2019. 182 pp. + appendices and addenda. Available online: https://www.fws.gov/midwest/endangered/permits/hcp/r3hcps.html

Minnesota Geospatial Commons. 2016. Electric Transmission Lines and Substations, 60 Kilovolt and Greater, PDF Map. Available online at: https://gisdata.mn.gov/dataset/util-elec-trans. Access May 2021.

Minnesota Wildflowers. 2019. Available online at: https://www.minnesotawildflowers.info/. Accessed April 2021.

MN DEED. 2021. Mower County Profile. https://mn.gov/deed/assets/100920_mowerco_tcm1045-407642.pdf. Accessed March 2021.

MPUC. 2008. Before the Minnesota Public Utilities Commission. Available online at: https://mn.gov/eera/web/project-file/11431/. Access March 2021.

MNDNR. 2016a. Designated Wildlife Lakes in Minnesota. Available online at: https://gisdata.mn.gov/dataset/env-designated-wildlife-lakes. Accessed March 2021.

MNDNR. 2016b. DNR Calcareous Fen List. Available online at: https://gisdata.mn.gov/dataset/biota-nhis-calcareous-fensf. Accessed January 2022.

MNDNR. 2016c. Minnesota's Wildlife Action Plan 2015-2025. Division of Ecological and Water Resources. Available online: https://files.dnr.state.mn.us/assistance/nrplanning/bigpicture/mnwap/wildlife-action-plan-2015-2025.pdf

MNDNR. 2016d. Migratory Waterfowl Feeding and Resting Areas. Minnesota Department of Natural Resources. Available online: https://gisdata.mn.gov/dataset/env-migratory-waterfowl-areas

MNDNR. 2018a. Calcareous Fens Factsheet. Available online at: https://files.dnr.state.mn.us/natural_resources/water/wetlands/calcareous_fen_fact_sheet.pdf. Accessed March 2021.

MNDNR. 2018b. Minnesota Department of Natural Resources Guidance for Commercial Wind Energy Project. Published in October 2011, updated July 2018. Available online: http://files.dnr.state.mn.us/publications/ewr/dnr_wind_energy_project_guidance_2011.pdf

MNDNR. 2019. Minnesota Buffer Law. Available online at: https://bwsr.state.mn.us/minnesota-buffer-law. Accessed March 2021.

MNDNR. 2020a. Protected Waters and Wetlands, Mower County, Minnesota. Available online at: https://files.dnr.state.mn.us/waters/watermgmt_section/pwi/MOWE1OF1.pdf. Accessed March 2021.

MNDNR. 2020b. Natural Heritage Information System. MNDNR, St. Paul, Minnesota. Accessed September 2020. Available online: https://www.dnr.state.mn.us/nhnrp/nhis.html

MNDNR. 2021a. MNDNR Buffer Protection Map. Available online at: http://arcgis.dnr.state.mn.us/gis/buffersviewer/. Accessed March 2021.

MNDNR. 2021b. MnGeo Spatial Commons. Available online at: https://gisdata.mn.gov/. Accessed March 2021.

MNDNR. 2021c. Minnesota Groundwater Provinces 2021. Available online at: https://files.dnr.state.mn.us/waters/groundwater_section/provinces/2021-provinces.pdf. Accessed March 2021.

MNDNR. 2021d. Floodplain Maps and Technical Resources. Available online at: https://www.dnr.state.mn.us/waters/watermgmt_section/floodplain/fema_firms.html. Accessed March 2021.

MNDNR. 2021e. National Wetlands Inventory Update for Minnesota. Available online at: https://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html. Accessed March 2021.

MNDNR. 2021f. Definition of public waters. Available online at: https://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/pw_definition.html. Accessed May 2021.

MNDNR. 2021g. Ecological Classification System, Oak Savannah. Available online at: https://www.dnr.state.mn.us/ecs/222Me/index.html. Accessed March 2021.

MNDNR. 2021h. *Lythrurus umbratilis.* 2021. Available online at: https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AFCJB52080. Accessed January. 2021.

MNDNR. 2021i. *Phenacobius mirabilis.* 2021. Available online at: https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AFCJB30030. Accessed January 2021.

MNDNR. 2021j. *Lasmigona compressa.* 2021. Available online at: https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=IMBIV22020. Accessed January 2021.

MNDNR. 2021k. *Eryngium yuccifolium.* 2021. Available online at: https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=PDAPI0Z0V0. Accessed January 2021.

MNDNR. *Parthenium integrifolium.* Available online at: https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=PDAST6V060. Accessed November 2020.

MNDNR. 2021m. *Asclepias sullivantii.* Available online at: https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=PDASC021X0. Accessed January 20201.

MNDNR. 2021n. Valeriana edulis var. ciliate. Available online at: https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=PDVAL03073. Accessed February 2021.

MNDNR. 2021o. Minnesota Biological Survey Site Biodiversity Significant Ranks. Available online at: https://www.dnr.state.mn.us/eco/mcbs/biodiversity_guidelines.html. Accessed February 20201.

MNDNR. 2021p. Minnesota Native Plant Communities. Available online at: https://www.dnr.state.mn.us/npc/index.html. Accessed February 2021.

MNDNR. 2021q. Mammals in Minnesota (a partial list). Available online: https://www.dnr.state.mn.us/mammals/index.html

MNDNR. 2021r. Bats. Available online: https://www.dnr.state.mn.us/mammals/bats.html

MNDNR. 2021s. Reptiles and Amphibians of Minnesota. Available online: https://www.dnr.state.mn.us/reptiles_amphibians/index.html

MNDNR. 2018. Aggregate Source Information System. Available online at: https://www.dot.state.mn.us/materials/asis_GE.html Accessed March 2021.

Minnesota Board of Water and Soil Resources. 2019. State Funded Conservation Easements (RIM Reserve). Available online: https://gisdata.mn.gov/dataset/bdry-bwsr-rim-cons-easements

Minnesota Ornithologists Union (MOU). 2021. Query Sightings Database. Mower County. Available online: https://moumn.org/avian/query.php

Mixon, K. L., J. Schrenzel, D. Pile, R. Davis, R. Doneen, L. Joyal, N. Kestner, M. Doperalski, and J. Schadweiler. 2014. Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota. Minnesota Department of Natural Resources, New Ulm, Minnesota. 41 pp. Available online: http://files.dnr.state.mn.us/eco/ereview/avian-bat-protocols.pdf

Mower County FSA. 2021. Phone conversations with Michelle Janssen and Kirk Phelps, County Executive Director, on May 5, 2021.

Mower County NRCS. 2021. Phone conversation and email correspondence with Luke Bowe, Conservation Technician, on May 3, 2021 (phone) and May 5, 2021 (email).

Mower County SWCD. 2021. Phone conversation with James Fett, Watershed Technician, on April 29, 2021.

Mower County. 2002. Mower County Comprehensive Plan. Available online at: https://www.co.mower.mn.us/201/PW-Planning-and-Administration. Accessed March 2021.

Mower County. 2021a. Mower County Zoning Ordinance. Available online at: https://www.co.mower.mn.us/DocumentCenter/View/1168/Mower-County-Zoning-Ordinance-PDF. Accessed March 2021.

Mower County. 2021b. Mower County Zoning Maps. Available online at: https://www.co.mower.mn.us/216/Zoning-and-Land-Use. Accessed March 2021.

Mower County. 2021c. Mower County Comprehensive Plan. Available online at: https://www.co.mower.mn.us/DocumentCenter/View/1156/Implementation-Plan-PDF. Access March 2021

MPCA. 2000. Protecting Water Quality in Urban Areas – Best Management Practices for Dealing with Storm Water Runoff from Urban, Suburban and Developing Areas of Minnesota.

MPCA. 2021a. Understanding Environmental Justice https://mpca.maps.arcgis.com/apps/MapSeries/index.html?appid=f5bf57c8dac24404b7f8ef1717f57d00. Accessed February 2021.

MPCA. 2021b. What's in My Neighborhood. Available online at: https://www.pca.state.mn.us/data/whats-my-neighborhood. Accessed February 2021.

MPCA. 2021c. Construction Stormwater Special Waters Search. Available online at: https://mpca.maps.arcgis.com/apps/webappviewer/index.html?id=e03ef170fa3e41f6be92f9fafec100cc. Accessed March 2021.

National Audubon Society. 2021a. Christmas Bird Count Results. Available online: https://netapp.audubon.org/cbcobservation/

National Audubon Society. 2021b. Important Bird Areas. Available online: https://www.audubon.org/important-bird-areas

National Audubon Society (Audubon). 2021c. Mississippi Flyway: A River of Birds. Accessed May 2021. Available online: https://www.audubon.org/mississippi-flyway

National Land Cover Database. 2016. National Land Cover Map. Available online at: https://www.mrlc.gov/data?f%5B0%5D=category%3Aland%20cover. Accessed January 2021.

NIEHS. 2021. Electric & Magnetic Fields. Available at https://www.niehs.nih.gov/health/topics/agents/emf/index.cfm. Accessed December 2021.

Newman, C., F. Hornsby, W. Erickson, K. Murray, and J. Studyvin. Relationship between Bat Fatality Rates and Turbine Size at Wind Farms across the Continental U.S. and Southern Canada: A preliminary investigation into the occurrence of bat fatalities in relation to turbine size. National Wind Coordinating Collaborative Meeting. October 23, 2020

NPS. 1983. Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. Current version available online at http://www.nps.gov/history/local-law/arch_stnds_0.htm. National Park Service, Department of the Interior, Washington D.C.

NPS. 2017. Nationwide Rivers Inventory Interactive Mapper. Available online at: https://www.nps.gov/maps/full.html?mapId=8adbe798-0d7e-40fb-bd48-225513d64977. Accessed March 2021.

NRCS. 2021a. Wetlands Reserve Program. Available online at: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/home/?cid=STELPRDB1049327. Accessed March 2021.

NRCS. 2021b. Agricultural Conservation Easement Programs. Available online at: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/. Accessed March 2021.

NRCS. 2021c. Stewardship Lands Easement Locator. Available online at: https://nrcs.maps.arcgis.com/apps/webappviewer/index.html?id=60cb4564f7b4461ca9a61fa224c066ba. Accessed March 2021.

NRCS. 2021d. Web Soil Survey. Available online at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed March 27, 2021.

OSA. 2020. Office of the State Archaeologist (OSA) Portal. Online resource https://osa.gisdata.mn.gov/OSAportal. Accessed March 2021.

Osborn, R. G., C. D. Dieter, K. F. Higgins, and R. E. Usgaard. 1998. Bird Flight Characteristics near Wind Turbines in Minnesota. American Midland Naturalist 139(1): 29-38.

Pagel, J. E., D. M. Whittington, and G. T. Allen. 2010. Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance. U.S. Fish and Wildlife Service (USFWS), Division of Migratory Bird Management. February 2010. Available online: https://tethys.pnnl.gov/sites/default/files/publications/Pagel-2010.pdf

Rails-to-Trails Conservancy. 2021. TrailLink. Available online at: https://www.traillink.com/trail/wapsi-great-western-line-trail/. Accessed February 2021.

Reynolds, R. T., J. M. Scott, and R. A. Nussbaum. 1980. A Variable Circular-Plot Method for Estimating Bird Numbers. Condor 82(3): 309-313.

Rheude, M. 2021. Email dated February 23, 2021 from M Rheude (U.S. Fish and Wildlife Service) to M. Bohnenblust (Merjent, Inc.)

Tetra Tech. 2017. 2016 - 2017 Post-Construction Mortality Monitoring Annual Report, Pleasant Valley Wind Farm, Mower and Dodge Counties, Minnesota. Prepared for Northern States Power Company-Minnesota, Xcel Energy. Prepared by Tetra Tech, Bloomington, Minnesota. June 2017. Available online: https://mn.gov/commerce/energyfacilities/Docket.html?Id=25724

Tetra Tech. 2020. Wildlife Conservation Strategy/Avian and Bat Protection Plan, Mower Wind Energy Center Repowering Project, Mower County, Minnesota. Prepared for FPL Energy Mower County Wind, LLC, Juno Beach, Florida. Prepared by Tetra Tech. May 2020. Available online: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7BF0F4BE72-0000-CB15-BCCF-455E60BC9852%7D&documentTitle=20206-164032-01

TrendLine Insights, LLC (TrendLine Insights). 2021. Rose Creek Wind Project, Mower County Permit Application – Con Edison. Date of Issue: May 11, 2021.

U.S. Census Bureau. 2021a. Quick Facts Minnesota. Available online at: https://www.census.gov/quickfacts/fact/table/mowercountyminnesota/POP060210. Accessed March 2021

U.S. Census Bureau. 2021b. Quick Facts Mower County. Available online at: https://www.census.gov/quickfacts/MN . Accessed March 2021

U.S. Census Bureau. 2021c. Adams Township. Available online at: https://data.census.gov/cedsci/profile?g=0600000US2709900208. Accessed April 2021

U.S. Census Bureau. 2021d. Lodi Township. Available online at: https://data.census.gov/cedsci/profile?g=0600000US2709937808 Accessed April 2021

U.S. Census Bureau. 2021e. Adams City. Available online at: https://data.census.gov/cedsci/all?q=adams,%20minnesota. Accessed May 2021.

U.S. Census Bureau. 2021f. Taopi City. Available online at: https://data.census.gov/cedsci/all?q=Taopi%20city,%20Mower%20County,%20Minnesota. Accessed May 2021.

USDA. 2017. 2017 Census of Agriculture: County Profile. Available online at: https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Minnesota/cp27099.pdf Accessed March 2021

USDA. 2021. Prime & Other Important Farmland Definitions. Available online at: https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/pr/soils/?cid=nrcs141p2_037285#:~:text=Prime%20farmland%2C%20as%20defined%20by,is%20available%20for%20these%20uses. Accessed March 2021

USDOT. 2018. National Transportation Noise Map. Available online at: https://maps.dot.gov/BTS/NationalTransportationNoiseMap/. Accessed June 2022.

USDOT. 2018. National Transportation Noise Map. Office of Spatial Analysis and Visualization at the Bureau of Transportation Statistics, U.S. Department of Transportation. Available online at: https://maps.dot.gov/BTS/NationalTransportationNoiseMap/. Accessed June 2021.

USDOT. 2020. National Pipeline Mapping System. Available online at: https://www.npms.phmsa.dot.gov. Accessed June 2021.

USFWS. 1971. Wetlands of the United States Circular 39. Available online at: https://www.fws.gov/wetlands/Documents/Wetlands-of-the-United-States-Their-Extent-and-Their-Value-to-Waterfowl-and-Other-Wildlife.pdf. Accessed March 2021.

USFWS. 2008. Personal Communication between Merjent Inc. and the USFWS Twin Cities Ecological Field Services Office – MBTA Timing Restrictions.

USFWS. 2012. Land-Based Wind Energy Guidelines. March 23, 2012. 82 pp. Available online: http://www.fws.gov/cno/pdf/Energy/2012_Wind_Energy_Guidelines_final.pdf. Accessed. January 2021.

USFWS. 2013. Eagle Conservation Plan Guidance. April 2013. Available online: https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf. Accessed January 2021.

USFWS. 2020a. Range-Wide Indiana Bat Survey Guidelines. March 2020. Available online: https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html

USFWS. 2020b. Known NLEB Hibernacula and Roost Trees. Available at http://files.dnr.state.mn.us/eco/ereview/minnesota_nleb_township_list_and_map.pdf. Accessed January 2021.

USFWS. 2020c. Prairie Bush Clover. Available online at: https://www.fws.gov/midwest/endangered/plants/prairiebushclover/prairieb.html. Accessed December 2020

USFWS. 2021a. Information for Planning and Conservation (IPaC). Available at https://ecos.fws.gov/ipac/. Accessed January 2021.

USFWS. 2021b. Northern Long-Eared Bat Myotis septentrionalis. Available online at: https://www.fws.gov/Midwest/Endangered/mammals/nleb/nlebFactSheet.html. Accessed January 2021.

USGS. 2020a. Locate Your Watershed. Available online at: https://water.usgs.gov/wsc/map_index.html. Accessed March 2021.

USGS. 2020b. National Hydrography Dataset. Available online at: https://www.usgs.gov/core-science-systems/ngp/national-hydrography. Accessed March 2021.

WEST. 2021a. Rose Creek Wind Project Northern Long-eared Bat Habitat Assessment. Prepared for Rose Creek Wind, LLC and ConEdison Development. Prepared by WEST, Golden Valley, Minnesota. Submitted to the Minnesota Department of Natural Resources and Energy Environmental Review Analysis. May 2021.

WHO. 2007. Environmental Health Criteria 238 - Extremely Low Frequency Fields. Available at https://www.who.int/peh-emf/publications/Complet_DEC_2007.pdf. Accessed December 2021.

Wright, H.E. 1972. Quaternary History of Minnesota. Published by the Minnesota Geological Survey. January 1.