Minnesota Public Utilities Commission
Large Wind Energy Conversion System Site Permit Amendment Application

Elm Creek II Wind Project
PUC Docket: IP6728/WS-09-553

Prepared for
Elm Creek Wind II, LLC
a subsidiary of Avangrid Power, LLC

Avangrid A member of the Iberdrola Group

March 2025

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Project Location:	Jackson and Martin Counties, Minnesota
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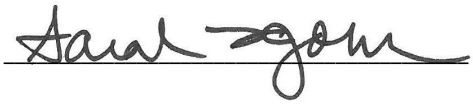
Signature:	
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Elm Creek II Wind Project

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Abbreviations

AADT	Average Annual Daily Traffic
ac	acres
ACS	American Community Survey
ADLS	Aircraft Detection Lighting System
AEP	annual energy production
AGL	Above Ground Level
AM	Amplitude Modulation
AMA	Aquatic Management Area
BCC	Birds of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
BMP(s)	Best Management Practice(s)
CO2	carbon dioxide
CON	Certificate of Need
CR(s)	County Road(s)
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSAH(s)	County State Aid Highway(s)
CWA	Clean Water Act
dB	decibels
DNR	Minnesota Department of Natural Resources
DOC	Minnesota Department of Commerce
DOT	Minnesota Department of Transportation
ECS	Ecological Classification System
eGRID	Emissions & Generation Resource Integrated Database
EJ	Environmental Justice
Elm Creek III	Elm Creek Wind II, LLC
EMF(s)	electromagnetic field(s)
EPA	Environment Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FM	Frequency Modulation
GHG	greenhouse gas
GRE	Great River Energy
IA	Interconnection Agreement
km	kilometers
kV	kilovolt
LMR	land mobile radio
LWECS	Large Wind Energy Conversion System

M	meters
MET	meteorological
MISO	Midcontinent Independent System Operator
MPCA	Minnesota Pollution Control Agency
MW	megawatt
MWFRA	Migratory Waterfowl Feeding and Resting Areas
NAC	noise area classification
NHIS	Natural Heritage Inventory System
NRCS	Natural Resources Conservation Service
O&M	Operation and Maintenance
OSA	Minnesota Office of the State Archaeologist
IPaC	Information for Planning and Consultation
PUC	Minnesota Public Utilities Commission
RIM	Reinvest in Minnesota
SBS	Site of Biodiversity Significance
SCADA	Supervisory Control and Data Acquisition
SHPO	State Historic Preservation Office
SSP	Shared Socioeconomic Pathway
SSURGO	Soil Survey Geographic Database
SWCD	Soil and Water Conservation District
SWPPP	Stormwater Pollution Prevention Plan
TV	television
ULS	Universal Licensing System
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
W/m^2	watts per meter squared
WCA	Minnesota Wetland Conservation Act
WECS	Wind Energy Conversion Systems
WEST	Western EcoSystems Technology, Inc.
WMA(s)	Wildlife Management Area(s)
WNS	white-nose syndrome
WPA	Waterfowl Protection Area

Minnesota Rule Chapter 7854.0500 Site Permit Application Contents		
Minnesota Rule	**Requirement**	**Application Section(s)**
Subpart 1	Applicant. An applicant for a site permit must provide the following background information regarding the applicant:	
Subpart 1, item A	A letter of transmittal signed by an authorized representative or agent of the applicant;	Included with filing
Subpart 1, item B	The complete name, address, and telephone number of the applicant and any authorized representative;	Cover Page
Subpart 1, item C	The signature of the preparer of the application if prepared by an agent or consultant of the applicant;	Cover Page
Subpart 1, item D	The role of the permit applicant in the construction and operation of the Large Wind Energy Conversion System (LWECS);	Section 1.2
Subpart 1, item 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;	Section 1.3
Subpart 1, item F	The operator of the LWECS if different from the applicant; and	Section 1.2
Subpart 1, item G	The name of the person or persons to be the permittees if a site permit is issued.	Cover page
Subpart 2, item 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.	Section 2
Subpart 2, item 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.	Section 2
Subpart 2, item 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.	Section 2
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.	Section 3
Subpart 4	Proposed site. The applicant shall include the following information about the site proposed for the LWECS and any associated facilities:	

Minnesota Rule Chapter 7854.0500 Site Permit Application Contents		
Minnesota Rule	**Requirement**	**Application Section(s)**
Subpart 4, item 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; (Map 1)	Map 1
Subpart 4, item B	The following characteristics of the wind at the proposed site:	
Subpart 4, item B(1)	interannual variation;	Section 9.1.1
Subpart 4, item B(2)	seasonal variation;	Section 9.1.2
Subpart 4, item B(3)	diurnal conditions;	Section 9.1.3
Subpart 4, item B(4)	atmospheric stability, to the extent available;	Not readily available
Subpart 4, item B(5)	turbulence, to the extent available;	Section 9.1.4
Subpart 4, item B(6)	extreme conditions;	Section 9.1.5
Subpart 4, item B(7)	speed frequency distribution;	Section 9.1.6
Subpart 4, item B(8)	variation with height;	Section 9.1.7
Subpart 4, item B(9)	spatial variations; and	Section 9.1.8
Subpart 4, item B(10)	wind rose, in eight or more directions;	Section 9.1.9
Subpart 4, item C	Other meteorological conditions at the proposed site, including the temperature, rainfall, snowfall, and extreme weather conditions; and	Section 9.1.10
Subpart 4, item D	The location of other wind turbines in the general area of the proposed LWECS.	Section 8.5.1
Subpart 5	Wind rights. The applicant shall include in the application information describing the applicant's wind rights within the boundaries of the proposed site.	Section 7
Subpart 6	Design of project. The applicant shall provide the following information regarding the design of the proposed project:	
Subpart 6, item A	A project layout, including a map showing a proposed array spacing of the turbines;	Map 2
Subpart 6, item 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;	Section 5
Subpart 6, item C	A description of the LWECS electrical system, including transformers at both low voltage and medium voltage; and	Section 5.3
Subpart 6, item D	A description and location of associated facilities.	Sections 5 and 10

Minnesota Rule Chapter 7854.0500 Site Permit Application Contents		
Minnesota Rule	**Requirement**	**Application Section(s)**
Subpart 7	Environmental impacts. An applicant for a site permit shall include with the application an analysis of the potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided, in the following areas:	
Subpart 7, item A	Demographics, including people, homes, and businesses;	Section 8.1
Subpart 7, item B	Noise;	Section 8.4
Subpart 7, item C	Visual impacts;	Section 8.5
Subpart 7, item D	Public services and infrastructure;	Section 8.6
Subpart 7, item E	Cultural and archaeological impacts;	Section 8.7
Subpart 7, item F	Recreational resources;	Section 8.8
Subpart 7, item G	Public health and safety, including air traffic, electromagnetic fields, and security and traffic;	Section 8.9
Subpart 7, item H	Hazardous materials;	Section 8.10
Subpart 7, item I	Land-based economics, including agriculture, forestry, and mining;	Section 8.11
Subpart 7, item J	Tourism and community benefits;	Sections 8.12 and 8.13
Subpart 7, item K	Topography;	Section 8.14
Subpart 7, item L	Soils;	Section 8.15
Subpart 7, item M	Geologic and groundwater resources;	Section 8.16
Subpart 7, item N	Surface water and floodplain resources;	Section 8.17
Subpart 7, item O	Wetlands;	Section 8.18
Subpart 7, item P	Vegetation;	Section 8.19
Subpart 7, item Q	Wildlife; and	Section 8.20
Subpart 7, item R	Rare and unique natural resources.	Section 8.21
Subpart 8	Construction of project. The applicant shall describe the manner in which the project, including associated facilities, will be constructed.	Section 10
Subpart 9	Operation of project. The applicant shall describe how the project will be operated and maintained after construction, including a maintenance schedule.	Section 10.6
Subpart 10	Costs. The applicant shall describe the estimated costs of design and construction of the project and the expected operating costs.	Section 10.7

Minnesota Rule Chapter 7854.0500 Site Permit Application Contents		
Minnesota Rule	**Requirement**	**Application Section(s)**
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.	Section 10.8
Subpart 12	Energy projections. The applicant shall identify the energy expected to be generated by the project.	Section 10.9
Subpart 13	Decommissioning and restoration. The applicant shall include the following information regarding decommissioning of the project and restoring the site:	
Subpart 13, item A	The anticipated life of the project;	Section 11
Subpart 13, item B	The estimated decommissioning costs in dollars;	Section 11
Subpart 13, item C	The method and schedule for updating the costs of decommissioning and restoration;	Section 11
Subpart 13, item D	The method of ensuring that funds will be available for decommissioning and restoration; and	Section 11
Subpart 13, item E	The anticipated manner in which the project will be decommissioned, and the site restored.	Section 11
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.	Section 12

1 Introduction and Applicant Information

Elm Creek Wind II, LLC (Elm Creek II), a subsidiary of Avangrid Power, LLC, currently operates an existing 148.8-megawatt (MW) wind energy generation facility located in Martin and Jackson counties, Minnesota (Facility) (Map 1). The Minnesota Public Utilities Commission (PUC) issued Elm Creek II a Large Wind Energy Conversion System (LWECS) Site Permit (PUC Docket: IP6728/WS-09-553) on February 25, 2010 and amended it on March 14, 2011 (Site Permit). The Facility began commercial operations in December 2010 and consists of 62 Mitsubishi MHI95 wind turbine generators with a capacity of 2.4 MW each, access roads, buried and overhead electrical collection lines, an electrical substation, an operations and maintenance building, and meteorological (MET) tower. The Site Permit expires on December 31, 2040. The Facility received a Certificate of Need (CON) from the PUC on February 19, 2010 (Docket IP-6728/CN-09-471).

Avangrid Power, LLC is a subsidiary of AVANGRID, Inc. and part of the IBERDROLA Group. IBERDROLA, S.A., is an international energy company with one of the largest renewable asset bases of any company in the world, with more than 32,000 MW of renewable energy spread across a dozen countries. Avangrid Power, LLC is headquartered in Portland, Oregon, and has more than $10 billion of operating assets totaling more than 8.7 gigawatts of owned and controlled wind and solar generation in 24 U.S. states.

Elm Creek II is proposing upgrades to increase the wind energy efficiency and energy output, and extend the operational life and permit term, of the Facility under a Site Permit Amendment per Minnesota Rules Chapter 7854. The proposed upgrades consist of repowering the existing Facility by retrofitting equipment with new components (Project). Elm Creek II is not proposing changes to the turbine locations, MET tower, or substation. The Project includes retrofitting up to 62 turbines as follows:

- Replacing rotors (i.e., nose cone, hub, and blades), therefore increasing the turbine rotor diameter from 95 meters (m) up to 120 m;
- Replacing turbine nacelles and interior elements;
- Installation of an adapter section at the top of the existing tower, increasing the hub height of the existing turbines from 78 m up to 86 m;
- Increase the tip height of the existing turbines from 127.5 m up to 146 m;
- Adjust the current turbine output for existing turbines from 2.4 MW to 2.2 MW; and
- Decrease total nameplate capacity below the existing 148.8 MW.

1.1 Changes Requested

To accomplish the Facility improvements, Elm Creek II requests that the PUC amend the Site Permit as outlined in Appendix A. The requested changes include:

- Amend the original Site Permit boundary to incorporate updated wind access buffer right requirements and increase acreage to 30,432 acres (ac);
- Extend the permit expiration date from December 31, 2040 to December 31, 2056, 30 years from the Facility's expected repowered date of commercial operation (December 31, 2026);
- Revise Site Permit Section II with updated associated facility descriptions;
- Extend the restoration time period from Site Permit Section III.B.12 from 8 months to 12 months, consistent with other recently approved projects;
- Grant waivers for wind access buffers (Site Permit Section III.C.1) and turbine spacing requirements (Site Permit Section III.E.5);
- Revise Site Permit Section III.E.4 with lighting mitigation system description;
- Revise Site Permit Section III.F.2 with updated noise submittal requirements; and
- Update Site Permit Section III. J.1 with updated wind rights submittal requirements.

The Facility currently has an Interconnection Agreement (IA) with Northern States Power (Transmission Owner) and the Midcontinent Independent System Operator (MISO) which allows for generation up to 150 MW net at the point of interconnection. Elm Creek II will require an IA amendment process to retrofit equipment. The amended IA will continue to allow for generation up to 150 MW net at the point of interconnection. Elm Creek II would maintain settings in the Facility's Supervisory Control and Data Acquisition (SCADA) and windfarm management system so the Facility does not exceed the net 150 MW limit at the point of interconnection.

Elm Creek II is pursuing a power purchase agreement (PPA) for the output from the retrofitted plant. The PPA will provide the customer with a long-term supply of wind generated electricity at a competitive price, generated by updated state-of-the art wind turbine technology. If a PPA is not achieved in the near term, Elm Creek II will be able to sell energy generated into the MISO market and related products, such as renewable energy credits, to other customers until a long-term PPA is executed.

1.2 Ownership Statement

Consistent with the original Site Permit, Elm Creek II will continue to own and operate the Facility.

1.3 Other Large Wind Energy Conversion Systems

Avangrid Power owns and operates approximately 550 MW of wind energy in Minnesota including the 100.5-MW Trimont Wind Project, the 99-MW Elm Creek I Wind Project, the 148.8-MW Elm Creek II Wind Project, the 51-MW Moraine I Wind Project, the 50-MW Moraine II Wind Project, and the 150-MW MinnDakota Wind Project (100 MW in MN and 50 MW in SD).

2 Certificate of Need

As previously stated, the Project consists of repowering of the existing Facilities. Minnesota Statutes, section 216B.243, subdivision 8(b) defines "repowering project" to include:

- Modifying a LWECS or a solar energy generating large energy facility to increase its efficiency without increasing its nameplate capacity;
- Replacing turbines in a LWECS without increasing the nameplate capacity of the system; or
- Increasing the nameplate capacity of a LWECS.

The Project is exempt from the requirement to obtain a CON pursuant to Minnesota Statutes, section 216B.243, subdivision 8(i) because the Project will not result in the system exceeding the nameplate capacity under its most recent IA with Northern States Power and MISO.

3 State Policy

The Project is considered a 'repowering project' under Minnesota Statutes, section 216B.243, subdivision 8b; the PUC follows the site permit amendment process when considering repowering projects under Minnesota Rule, part 7854.1300.

Elm Creek II prepared this application in accordance with the criteria specified in:

- Minnesota Statutes, section 216E.03, subdivision 7;
- Minnesota Rules, chapter 7854;
- Minnesota Department of Commerce, Energy Facility Permitting Application Guidance for Site Permitting of LWECSs in Minnesota (reference (1)); and
- PUC's General Wind Permit Standards (reference (2)).

Based on the incorporation of the requirements specified above and detailed in this application, Elm Creek II designed the Project to maximize the use of the existing infrastructure and wind resources, while minimizing impacts on land resources, adjacent wind resources, and the human and natural environment. Elm Creek II previously sited the Project in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources pursuant to Minnesota Statutes, section 216F.03. By repowering the Project, Elm Creek II is also extending the life of the Facility which avoids decommissioning and the need to source energy from a new project.

4 Project Description and Overview

4.1 Project Location and Area

The Project is located within Jackson and Martin counties, Minnesota, northeast of the City of Jackson and northwest of the City of Sherburn (Map 1). Elm Creek II is requesting an amended Site Permit boundary consisting of a slight increase in total acreage as a result of external spacing requirements. This amended Site Permit boundary encompasses approximately 30,432 ac and is described throughout this application as the Project Area. Elm Creek II is requesting the additional acreage be added to the original Site Permit Boundary to comprise the Project Area.

Map 2 illustrates the 2010 Site Permit boundary, proposed Project Area, and as-built Facility layout. The townships, ranges, and sections that are located within the Project Area are summarized in Table 4-1.

Table 4-1 Townships, Sections, and Ranges within the Project Area

County Name	Township	Range	Section(s)
Jackson	102	34	1, 2, 3, 4, 5, 8, 9, 10, 11, 12
	103	34	1, 2, 3, 10, 11, 12, 13, 14, 15, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35, 36
Martin	102	33	6, 7
	103	33	5, 6, 7, 8, 17, 18, 19, 20, 29, 30, 31, 32
	104	33	17, 18, 19, 20, 29, 30, 31, 32

4.2 Rated Capacity and Number of Turbines

The Project's turbine model(s) have not yet been finalized but could include a combination of the models listed in Table 4-2. The proposed wind turbine models will have a rated capacity ranging from 2.2 MW to 2.4 MW. All three turbine models would utilize the existing turbine layout with the potential to retrofit up to 62 turbines. The final layout will take into consideration regulatory setbacks as described in Section 5.1.

Table 4-2 Proposed Turbine Models Summary

Design Parameter	Existing MHI95	Vestas V120	Vestas V110	Change
Hub Height	80 m (262 ft)	85.2 m (279.5 ft)	85.2 m (279.5 ft)	Up to +5.2 m (17 ft)
Rotor Diameter	95 m (312 ft)	120 m (394 ft)	110 m (361 ft)	Up to + 25 m (82 ft)
Rotor Swept Area	7,088 m^2 (76,297 ft^2)	11,310 m^2 (121,737 ft^2)	9,503 m^2 (102,293 ft^2)	Up to + 4,222 m^2 (45,440 ft^2)
Total Tip Height	127 m (417 ft)	145.2 m (477 ft)	140.2 m (460 ft)	Up to + 18.2 m (60 ft)
Nameplate Capacity of a Single Turbine	2.4 MW	2.2 MW	2.2 MW	Up to - 0.2 MW

The Project is expected to decrease the total nameplate capacity below the existing 148.8 MW. Although the repowering will result in a decrease in nameplate capacity, the retrofitted equipment will result in an increase in swept area and efficiency at lower wind speeds. These changes correlate to an increase in Annual Energy Production (AEP).

5 Project Design

5.1 Project Layout

The as-built Facility layout is shown on Map 2. Elm Creek II is not proposing changes to the existing turbine locations, access roads, MET tower, or substation. The retrofitted turbines will increase the rotor diameter from 95 m (312 ft) up to 120 m (394 ft) and overall tip height from 127 m (417 ft) up to 145.2 m (477 ft). Table 5-1 summarizes the setback requirements and design standards for the Project based on the original 2010 Site Permit and PUC's General Wind Permit Standards. Section 8.2 summarizes the County setback requirements and design standards applicable to projects under their jurisdictions.[1] Both the PUC setback requirements and the County setback requirements are shown in Map 4. For purposes of this application, Elm Creek II has based its analyses on the largest rotor diameter of 120 meters at the 62 turbine locations. Elm Creek II requests waivers for wind turbines listed in Table 5-1 that would no longer comply with current wind access buffer or internal turbine spacing setback requirements after the proposed repower.

[1] Jackson and Martin Counties regulate wind energy conversion systems (WECS) with a rated capacity of less than 25,000 kilowatts (kW) or 25 megawatts (MW) and regulate the installation and operation of WECS not otherwise subject to siting and oversight by the State of Minnesota pursuant to Minnesota Statutes, Chapter 216F, Wind Energy Conversion Systems, as amended.

Table 5-1 PUC LWECS Setbacks and Design Standards

Setback Requirement	Current MPUC Guidance	2010 Site Permit	Project Conformance with Setback Or Design Standard
Wind Access Buffer [1]	Three times the rotor diameter on the non-prevailing wind axis and five times the rotor diameter on the prevailing wind directions from the perimeter of the property does not hold wind rights, including all public lands.	Wind turbine towers shall not be placed less than 5 rotor diameters on the prevailing wind directions and 3 RD on the non-prevailing wind directions from the perimeter of the lands where the Permittee does not hold the wind rights, without the approval of the Commission.	Elm Creek II requests a waiver from this requirement for the following turbines (20): L1, N1, P1, Q1, S4, T1-3, U1-3, X13, X5, Y1, Y3, Z1, Z3-4.
Internal Turbine Spacing [1]	Three times the rotor diameter in the non-prevailing wind directions and five rotor diameter on the 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.	The turbine towers shall be spaced no closer than 3 RD in the non-prevailing wind directions and 5 RD on the 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.	Elm Creek II requests a waiver from this requirement for the following turbines (44): N1-4, P1-8, Q1-5, R1-5, S2-3, T2-3, U1-3, V1-5, V7-9, X1-5, Z2-3.
Public Lands [1]	Wind turbines and associated facilities including foundations, access roads, underground cable and transformers, shall not be located in public lands, including Waterfowl Production Areas, Wildlife Management Areas (WMAs), Scientific and Natural Areas or county parks, and wind turbine towers shall also comply with the wind access buffer setbacks.	Wind turbines and associated facilities including foundations, access roads, underground cable, and transformers, shall not be located in Waterfowl Production Areas, State WMAs or Scientific and Natural Areas or in county parks.	Turbines Q3 and Q4 would not comply with the wind access buffer setbacks in current MPUC Guidance after the proposed repower. Accordingly, Elm Creek II is coordinating with the Minnesota Department of Natural Resources (DNR) on the potential to enter into a wind rights agreement. If no wind rights agreement is reached, Elm Creek II will continue to comply with the wind access buffer setbacks associated with the Artz WMA with existing infrastructure.

Setback Requirement	Current MPUC Guidance	2010 Site Permit	Project Conformance with Setback Or Design Standard
Residences [1]	At least 500 ft (150 meters [m]) or the minimum distance required to meet the state noise standard of 50 decibels (dB) using the A-weighted scale (dB(A)), whichever is greater.	Wind turbine towers shall not be located closer than 1,000 feet from the nearest residence unless a waiver has been signed by the property owner, or the distance required to comply with the noise standards established by the MPCA at paragraph II,E,3, whichever is greater.	Project is in conformance. Residences are located over 1,000 feet from the nearest turbine tower.
Sound [2]	Setback distance calculated based on site layout and turbine for each residential receiver. State standard 50 dB, A-weighted scale (dBA).	The Permittee or its contractor may install and operate turbines as close as the minimum setback required in this Permit but in all cases shall comply with PCA noise standards.	Project will be in conformance.
Public Roads and Recreational Trails [1]	No closer than 250 ft (75m) from the edge of the public right-of-way ROW. Trails considered on a case-by-case basis.	Wind turbine and meteorological towers shall not be located closer than 250 feet from the edge of the nearest public road right-of-way.	Project is in conformance.
Wetlands [1]	No turbines within public water wetlands. Collector and/or feeder lines can be within wetlands with approval from the agency having jurisdiction.	Wind turbines and associated facilities including foundations, access roads, underground cable and transformers, shall not be placed in public waters wetlands, as defined in Minnesota Statutes section 1O3G.OO5, subp. 15a. However, electric collector or feeder lines may cross or be placed in public waters or public waters wetlands subject to Minnesota Department of Natural Resources (DNR), U.S. Fish and Wildlife Service (USFWS) and/or United States Army Corps of Engineers (USACE) permits and approvals.	Project is in conformance. The Project will obtain any necessary permits required for construction access during the repower.
Native Prairie [1]	Facility infrastructure cannot be within a native prairie without an approved protection plan.	Wind turbines and all associated facilities, including foundations, access roads, underground cable and transformers, shall not be placed in native prairie unless addressed in the prairie protection and management plan.	Project is in conformance. The Project will complete a native prairie plan prior to construction. The Project does not anticipate construction impacts to native prairie at this time.

Setback Requirement	Current MPUC Guidance	2010 Site Permit	Project Conformance with Setback Or Design Standard
Sand and Gravel Operations [1]	Facility infrastructure cannot be within active sand and gravel operations without landowner approval.	Wind turbines and all associated facilities, including foundations, access roads, underground cable, and transformers shall not be located within active sand and gravel operations, unless otherwise negotiated with the landowner with notice given to the owner of the sand and gravel operation.	Project is in conformance.
Aviation [1]	Facility infrastructure cannot create an obstruction to navigable airspace.	Towers shall be marked as required by the Federal Aviation Administration (FAA). There shall be no lights on the towers other than what is required by the FAA. This restriction shall not apply to infrared heating devices used to protect the wind monitoring equipment.	Project is in conformance.

Setback Requirement	Current MPUC Guidance	2010 Site Permit	Project Conformance with Setback Or Design Standard
Underground and Overhead Electric Collector and Feeder Lines [1]	The permittee shall place electrical lines, known as collectors, communication cables, and associated electrical equipment such as junction boxes underground when located on private property. Collectors and cables shall also be placed within or adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner. This paragraph does not apply to feeder lines. The permittee shall place overhead or underground 34.5 kilovolt (kV) electric lines, known as feeders within public rights-of-way or on private land immediately adjacent to public rights-of-way if a public right-of-way exists, except as necessary to avoid or minimize human, agricultural, or environmental impacts. Feeder lines may be placed on public rights-of-way only if approval or the required permits have been obtained from the governmental unit responsible for the affected right-of-way. In all cases, the permittee shall avoid placement of feeder lines in locations that may interfere with agricultural operations. Notwithstanding any of the requirements to conduct surveys before any construction can commence, the permittee may begin immediately upon issuance of a Large Wind Energy Conversion System (LWECS) site permit to construct the 34.5 kV feeder lines that will be required as part of the project.	The Permittee shall place electrical lines, known as collectors, and communication cables underground when located on private property. Collectors and cables shall also be placed within or adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner. Junction boxes are also required when underground cables need to be spliced together. The junction boxes shall be located adjacent to wind turbines or at the edge of a field so as not to interfere with farming practices on the parcel, to the extent possible. The Permittee shall place overhead or underground 34.5 kV electric lines, known as feeders, within public rights-of-way or on private land immediately adjacent to public rights-of-way if a public right-of-way exists, except as necessary to avoid or minimize human, agricultural, or environmental impacts. A change in feeder line locations may be made as long as feeders remain on public rights-of-way and approval has been obtained from the governmental unit responsible for the affected right-of-way. When placing feeders on private property, the Permittee shall place the feeder in accordance with easements negotiated with the affected landowner. In all cases, the Permittee shall avoid routing feeder lines in locations which may interfere with agricultural operations.	Project is in conformance. Any upgrades to electrical lines will be completed in the existing easement. Refer to Section 6.2 for more details.

Setback Requirement	Current MPUC Guidance	2010 Site Permit	Project Conformance with Setback Or Design Standard
Footprint Minimization	The Permittee shall design and construct the LWECS so as to minimize the amount of land that is impacted by the LWECS. Associated facilities in the vicinity of turbines such as electrical/electronic boxes, transformers, and monitoring systems shall, to the greatest extent feasible, be mounted on the foundations used for turbine towers or inside the towers unless otherwise negotiated with the affected landowner(s).	The Permittee shall design and construct the LWECS so as to minimize the amount of land that is impacted by the LWECS. Associated facilities in the vicinity of turbines such as electrical/electronic boxes, transformers and monitoring systems shall, to the greatest extent feasible, be mounted on the foundations used for turbine towers or inside the towers unless otherwise negotiated with the affected landowner.	Project is in conformance. There will be no change in development footprint as part of this repower. The requested amendment to the Site Permit Boundary is a result of the Wind Access Buffer setback requirement.
Meteorological (MET) towers	Permanent towers for MET equipment shall be free-standing. Permanent MET towers shall not be placed less than 250 feet (76 meters) from the edge of the nearest public road ROW and from the boundary of the Permittee's site control, or in compliance with the county ordinance regulating MET towers in the county the tower is built, whichever is more restrictive. MET towers shall be placed on property the Permittee holds the wind or other development rights.	New temporary and permanent MET towers shall not be placed less than 250 feet from the edge of the nearest public road right-of-way and from the boundary of the Permittee's site control, or in compliance with the county ordinance regulating MET towers in the county the tower is built, whichever is more restrictive. MET towers shall be placed on lands the Permittee holds the wind or other development rights.	Project is in conformance. No changes are proposed to the MET tower.
Communication Cables	The Permittee shall place all supervisory control and data acquisition (SCADA) communication cables underground and within or adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner(s).	The Permittee shall place electrical lines, known as collectors, and communication cables underground when located on private property. Collectors and cables shall also be placed within or adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner.	Project is in conformance. Any upgrades to communication cables will be completed in the existing easement, adjacent to the de-energized cables.

[1] Order Establishing General Wind Permit Standards, Docket Number E,G-999/M-07-1102, January 11, 2008

[2] Minnesota Rules, chapter 7030

Elm Creek II is in the process of negotiating additional wind rights-only agreements for the repower. Refer to Section 7 for additional details on the status of wind rights for the Project.

The original Facility was sited and designed to standards in effect in 2010. As part of this repower, Elm Creek II is requesting waivers from internal spacing requirements at 44 turbines: N1-4, P1-8, Q1-5, R1-5, S2-3, T2-3, U1-3, V1-5, V7-9, X1-5, Z2-3. Internal turbine spacing was originally implemented to ensure LWECS projects were designed and sited in a manner that ensured "efficient use of the wind resources, long-term energy production, and reliability" (Minn Stat. 216F.03). A review of the Department of Commerce's (DOC) comments in the MPUC's docket establishing general wind permit standards (See references (2); (3)) indicates that the internal spacing siting order requirement is based on potential production losses and is directed more towards the predominant wind direction with respect to concerns regarding lower energy production, maintenance costs, and downwind turbulence. The DOC's comments also note that these concerns are dependent on site characteristics, wind resources, and site layout. Notably, only one turbine (Turbine V4) will exceed internal spacing requirements in the predominant wind direction after the proposed repower.

Elm Creek II is not proposing to change the spacing and layout of the turbines as part of this repower scope. A variety of analyses have been completed to confirm the AEP and overall use of the wind resources in the area. Elm Creek II completed a wake loss analysis in 2024 which is included as Appendix B (Appendix B is designated as non-public in its entirety). Elm Creek II has estimated a total wake loss of 8.7% for the Project, which is consistent with other projects in Minnesota. In addition, the Project is not required to implement any wind sector management curtailment due to spacing and has been deemed suitable by the original equipment manufacturer for operation with rotor diameters up to 120 m. Overall, repowering of the Facility with its current turbine spacing still allows for an increase in uplift and therefore higher AEP largely attributable to the advancements in technology and greater efficiencies at lower wind speeds.

Repowering of the Facility meets the goals set by the LWECS site permitting process to ensure that each project is sited "in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources" (Minn Rules 7836.0200). Repowering minimizes environmental impacts by utilizing an existing facility to avoid new impacts to sensitive resources, preserving the existing compatible agricultural use in the area, improving an existing Facility, demonstrating sustainable development, and increasing long-term energy production.

5.2 Description of Turbines and Towers

The Project includes retrofitting equipment at up to 62 turbines as follows:

- Installation of an adapter section at the top of the existing tower and used to connect the replaced nacelle to the existing turbine towers (Figure 5-1);
- Replacing turbine nacelles and interior elements (e.g., gearbox, oil cooler, drive shaft, and pitch drive). The replaced nacelles will be mounted on the adapter section;

- Replacing rotors (i.e., nose cone, hub, and blades), therefore increasing the turbine rotor diameter from 95 m up to 120 m;
- Replacing generators of up to 62 turbines from 2.4 MW to 2.2 MW per turbine; and
- Installation of new 34.5-kilovolt (kV) collector line system (buried) and capacitor bank within existing easements, as needed.

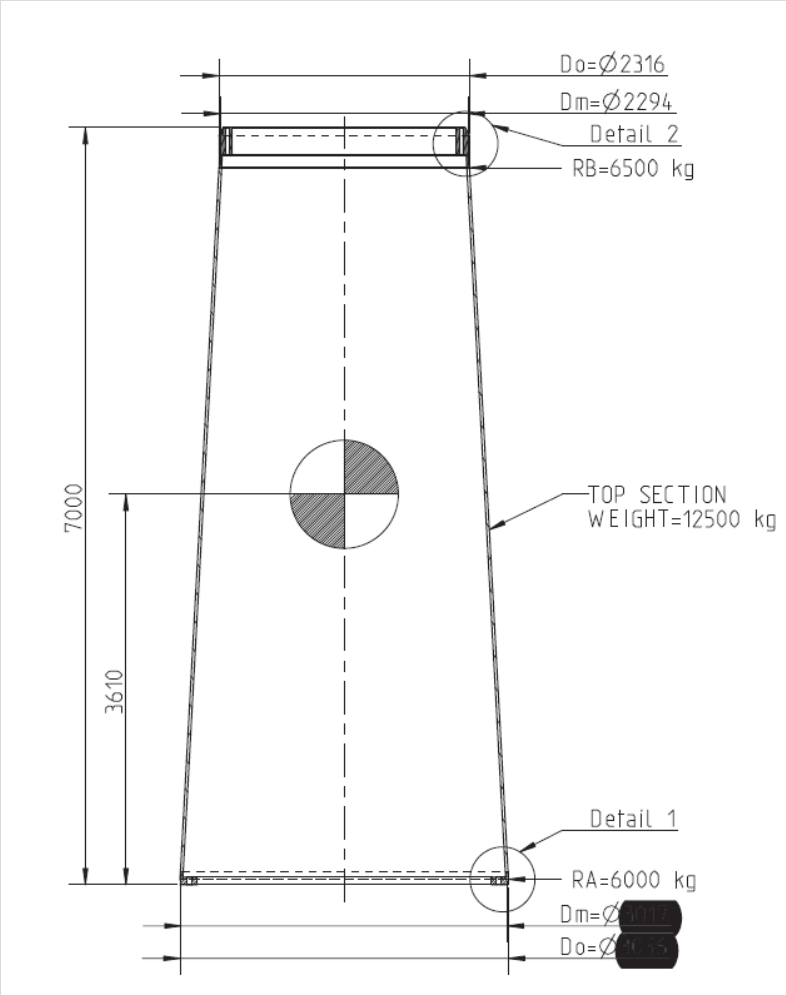

Figure 5-1 Adapter Section Typical

The structures for up to 62 retrofitted wind turbines will remain self-supporting tubular towers. The retrofitted hub heights would increase by up to 7 m (23 ft) with the addition of the adapter section. Any remaining MHI95 turbines that are not retrofitted will remain the same height. Each tower was built on its own concrete foundation, which is approximately 446 cubic yards of reinforced concrete. A graveled area approximately 18 ft in diameter surrounds the foundation pedestal. Elm Creek II and equipment manufacturers have conducted evaluations of the existing wind turbines to determine suitability to continue to operate within design parameters after the retrofit.

The nacelle houses the main components of the wind turbine generator. The nacelles for each turbine will remain of comparable overall size and dimensions.

5.3 Description of Electrical System

The electrical system will be the same as permitted in 2010 with limited upgrades to the collection system as described in Section 6.2. Each turbine will continue to have its own nacelle-mounted step-up transformer that increases the voltage at the turbine terminals to 34.5 kV for the collector circuits that transmit the power from the turbines to the Project substation. The Facility will continue to connect with the existing Lakefield Generation Substation via the shared Elm Creek II and Trimont Wind electrical substation and associated 34.5 kV aboveground collection line.

6 Description and Location of Associated Facilities

6.1 Transmission and Project Substation

The Project does not require a new transmission line. No changes are anticipated to the Project substation. The existing Facility substation is located approximately 6.25 miles west of Trimont, Minnesota, on the south side of 220th Street. Collection lines transmit the power from the turbines to the Project substation.

The existing substation has a small building within the fenced area that houses the control and relaying equipment, station batteries, and SCADA system. The entire substation is enclosed by a looped chain link fence. The SCADA system is capable of monitoring and controlling most aspects of the substation facility. The computerized data network will provide detailed operating and performance information for each wind turbine.

6.2 Collector Lines and Feeder Lines

The existing collector and communication cables between turbines are primarily underground, buried in trenches between 3 and 5 feet deep. Elm Creek II contracted Westwood Professional Services to evaluate the electrical system with the retrofit updates and support the proposed repower scope. The study determined that the existing buried collector system will require limited upgrades to accommodate the Project. This includes installing new 34.5-kV collector lines, where required, adjacent to the existing lines and within existing easements. Elm Creek II does not expect to replace any overhead collector lines as part of the Project at this time. Elm Creek II will decommission the original and new collector line systems once the Facility retires in accordance with decommissioning requirements. The study also determined the need to install one capacitor bank unit. The capacitor bank unit is a piece of electrical equipment capable of producing reactive power that is located in a metal enclosure. The capacitor bank unit will be installed on an engineered foundation approximately 15 feet by 25 feet and will be connected to the existing collection system. The capacitor bank unit will be located adjacent to Turbine U1 or at the edge of the field so as not to interfere with agricultural operations on the parcel. The location will be in accordance

with easements negotiated with the affected landowner and will be sited to avoid impacts to native prairie and wetlands.

Vendor sound level data are not currently available for the capacitor bank unit. Noise will be considered during detailed design and capacitor bank unit specifications developed to ensure potential noise from this equipment does not contribute to an exceedance of the Minnesota noise standards. As currently planned, the closest receptor is approximately 2,300 feet away from the capacitor bank unit. At a distance of 2,300 feet, geometric spreading or distance losses would reduce equipment sound levels by over 45 dBA. Potential capacitor bank unit sound levels will be incorporated into the preconstruction noise submittal.

6.3 Additional Associated Facilities

6.3.1 Operations and Maintenance Facility

There will be no upgrades to the existing Operation and Maintenance (O&M) facility. This building serves as a center for the Facility's O&M efforts, provides access and storage, and houses the SCADA system. The O&M facility is located along 600th Avenue within Enterprise Township.

6.3.2 Permanent Meteorological Tower

The Facility currently has a single, permanent 80 m (262.5 ft) tall MET tower that meets Federal Aviation Administration (FAA) and local requirements for lighting and marking (Map 2). Elm Creek II is not currently planning to construct any new permanent MET towers.

6.3.3 Aircraft Detection Lighting System

An Aircraft Detection Lighting System (ADLS) radar system turns FAA-required turbine lights on when low-flying aircraft are detected nearby. In accordance with Minn. Stat. § 216F.084, Elm Creek II is coordinating with the FAA regarding installation of ADLS for the Project. The ADLS tower will be similar to a MET tower; it will be free-standing and require a temporary workspace of approximately 75 feet by 75 feet. An analysis has been completed for the Project by an FAA-approved ADLS technology vendor. The Project anticipates the ADLS system to be located within the existing O&M property. At its proposed location in the O&M yard, the ADLS tower will not impact native prairie, wetlands, or other sensitive resources; however, the final tower location will be determined based on review and approval by the FAA, participating landowners, and environmental conditions.

7 Wind Rights

All current and proposed repower Facilities are located on leased land that followed the state siting and permitting protocols for wind energy development that were in place at the time of the original Project design and construction in 2010. Elm Creek II has been the owner and operator of the Facility since its construction in 2010 and has a good relationship with the community. In addition, Elm Creek II is partnered with I-90 LLC, which consists of more than 94 local farmer and landowner members who own land covering 35 square miles straddling the Martin-Jackson county line. I-90 LLC owners receive the

traditional lease payments for turbine and infrastructure siting and also own an interest in the Facility's gross revenues through a revenue participation interest agreement. Elm Creek II is working with individual landowners and I-90 LLC to extend the term of existing land leases of participating landowners and secure sufficient wind rights agreements necessary to repower, operate, and maintain the Project through 2056.

Elm Creek II has executed and recorded 16,572 ac of existing landowner leases, approximately 54% of the private land within the Project Area.

The Project began outreach in summer 2023, notifying the landowners of activities in the area related to the repower. Since then, Elm Creek II has had ongoing discussions with impacted landowners regarding wind rights agreements and lease extensions. A landowner dinner was held in October 2024 to provide landowners the opportunity to ask questions and learn more about the repower. Additional community engagement will continue through the 2025 development phase and into construction.

Given the larger 3RDx5RD wind access buffers that would result from the Project, Elm Creek II is pursuing 46.48 ac of new wind rights-only agreements on 20 non-participating parcels to accommodate the wind access buffers at 20 turbines: L1, N1, P1, Q1, Q3-4, S4, T1-3, U1-3, X1-3, X5, Y1, Y3, Z1, and Z3-4. These parcels are owned by 16 landowners and include four existing Project participants. Two of these new wind rights parcels are located outside of the original 2010 Site Permit Boundary, which has led to Elm Creek II's request to amend the Site Permit Boundary (Map 2). Current participating parcels are shown on Map 3, which illustrates the current leased lands and wind right agreements.

Appendix C outlines the parcels currently under negotiation for wind access rights and summarizes Elm Creek II's wind rights waiver requests by parcel, with the exception of Parcel 60280300. This parcel, which is associated with the Artz WMA, is not included in Appendix C's wind rights waiver request. The increase in rotor diameter at Turbines Q3 and Q4 does not comply with wind access buffer setbacks, as discussed in Table 5-1. Elm Creek II is coordinating with the DNR on the potential to enter into a wind rights agreement. If a wind rights agreement with the DNR is not achieved, Elm Creek II will continue to comply with the current wind access buffer setbacks associated with the Artz WMA with existing infrastructure.

Elm Creek II will continue to negotiate with landowners through 2026. To date, the Project has secured four new wind rights agreements related to the repower. If unsuccessful in obtaining wind rights for the 20 non-participating parcels (16 landowners), Elm Creek II will extend a best and final offer to the remaining landowners and will at that time request the Commission grant waivers from wind access buffer setback requirements for the remaining turbines identified in Appendix C. Elm Creek II will provide the Commission updated information on the status of the remaining wind rights prior to construction.

8 Environmental Impacts

The following subsections provide a description of the existing environmental and human setting of the Project Area, analysis of the potential impacts of the Project and associated mitigative measures, and any unavoidable adverse environmental effects. In this application, the term "mitigative measures" means proposed actions that will avoid or minimize impacts, including best management practices (BMPs), and

any proposed actions to compensate for unavoidable impacts (compensatory mitigation). A summary of agency correspondence is included in Section 12.

8.1 Demographics

Elm Creek II compiled the existing demographic conditions near the Project based on data from the U.S. Census Bureau 2020 Census and the 2017-2021 American Community Survey (ACS) 5-Year Estimates, unless otherwise noted. The Project is in southwestern Minnesota in a rural agricultural region, within portions of Jackson and Martin County (Map 1).

Martin County has less than one percent of the state's total population. In 2020, the population of Martin County was 20,025. In 2021, the estimated population density was 27.3 persons per square mile (reference (4)).

Jackson County also has less than one percent of the state's total population. In 2020, the population of Jackson County was 9,992. In 2021, the estimated population density was 13.9 persons per square mile (reference (5)).

Table 8-1 summarizes population and economic characteristics for the state of Minnesota, Jackson and Martin counties, and townships where the Project is located. The majority of the population in these areas is Caucasian, with a lower percentage of total minority residents compared to the state of Minnesota. Per capita income within the townships where the Project Area is located ranges from below statewide average to above statewide average.

Table 8-1 Population and Economic Characteristics

Location	Total Population	Population Density (persons per sq. mile)	Minority (%)	Housing Units (Occupied)	Per-capita Income	Persons below poverty level (%)
Minnesota [1]	5,706,494	701.7	22.5	2,253,990	$41,753	9.3
Martin County [2]	20,025	28.1	8.3	8,748	$32,818	10.8
Jackson County [3]	9,989	14.2	8.5	4,307	$35,766	10.3
Enterprise Township [4]	104	2.9	2	44	$31,511	2.9
Wisconsin Township [5]	213	6	0.05	85	$58,161	7.0
Elm Creek Township [6]	196	5.4	0.03	63	$45,631	7.5
Cedar Township [7]	196	5.5	0.03	78	$42,171	7.7

[1] reference (6)
[2] reference (4)
[3] reference (5)
[4] reference (7)
[5] reference (8)
[6] reference (9)
[7] reference (10)

Manufacturing and service industries (restaurants, hotels, repair shops, convenience, and retail stores) are concentrated in the urban areas located west of the Project Area, in Jackson, and east of the Project Area, in Trimont and Sherburne. Table 8-2 lists the top three industries in Jackson and Martin counties, in terms of employment, with data for the state of Minnesota also provided for context.

Table 8-2 Top Three Industries by Employment

Location	Top Industries in Terms of Employment	Percentage
Minnesota [1]	Educational services, and health care, and social assistance	25.2
	Manufacturing	13.4
	Retail trade	11.0
Martin County [2]	Educational services, and health care, and social assistance	23.7
	Manufacturing	17.5
	Retail trade	12.5
Jackson County [3]	Manufacturing	21.9
	Educational services, and health care, and social assistance	20.7
	Agriculture, Forestry, Fishing and Hunting, and Mining	9.8

[1] reference (6)
[2] reference (4)
[3] reference (5)

8.1.1 Project Area Environmental Justice Analysis

TheMPCA defines Environmental Justice (EJ) as, "the right of communities of color, Indigenous communities, and low-income communities, to the enjoyment of a healthy environment and to fair treatment with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." (reference (11)). EJ helps create equitable benefits of environmental protections and opportunities to participate in decisions that may affect the environment or health of a community (reference (12)).

The MPCA maintains a GIS-based database that outlines community areas with EJ concerns within the State of Minnesota (reference (13)). This tool uses data at the county-wide level for environmental and socioeconomic factors related to EJ. The MPCA uses data from the U.S. Census Bureau's five-year 2017-2021 summary of ACS Survey data.

The MPCA mapping tool and U.S. Census data were used to identify EJ communities located near the Project. The MPCA mapping tool considers tribal areas and census tracts with higher concentrations of low-income, limited English proficiency, and minority populations as areas of increased concern for EJ. According to the Minnesota Statutes 2023, section 115A.03, chapter 60, an "EJ area" is defined as one or more census tracts in Minnesota in which:

(1) based on the most recent decennial census data published by the United States Census Bureau:

a. 40 percent or more of the population is nonwhite;

b. 35 percent or more of the households have an income at or below 200 percent of the federal poverty level; or

c. 40 percent or more of the population over the age of five has limited English proficiency; or

(2) located within Indian Country, as defined under United States Code, title 18, section 1151.

There are four census tracts located within the Project Area. Census Tracts 7901, 7902, 7903 and 4801 are considered representative of the population within and adjacent to the Project and provide the best approximation of the area within which potential disproportionate adverse impact from the Project could occur (Map 5).

As summarized in Table 8-3, there are two tracts within the Project Area that reach 35 percent of the population (when percent error is included)[2] that report income at or below 200 percent of the federal poverty level. Census tract 7901 reports 31.5 percent of the population is below 200 percent of the federal poverty level with a +/- 8.58-percent error. Census tract 7902 reports 28.6 percent of the population is below 200 percent of the federal poverty level with a +/- 9.82-percent error. No census tracts have a minority population greater than 40 percent, and no census tracts have a population of people with limited English proficiency over 40 percent. In addition, the Project Area does not cross federally recognized tribal areas.

Table 8-3 Environmental Justice Data for Census Tracts

Location	Population	Percent Limited English Speaking	Percent Below 200 Percent of Federal Poverty Level	Percent Total Minority
Minnesota	5,706,494	2.2	22.5	22.5
Census Tract 7901	2,930	0.6	31.5[1]	4.3
Census Tract 7902	2,475	0.9	28.6[2]	5.6
Census tract 7903	2,318	0.5	22.4	3.7
Census Tract 4801	2,175	1.4	17.8	4.11
Martin County	20,025	0.4	29.6	8.3
Jackson County	9,989	0.8	28.8	8.5

[1] Given the +/- 8.58% error reported within the MPCA mapping tool, this tract is mapped as an EJ area for exceeding the following threshold: 35 percent or more of the households have an income at or below 200 percent of the federal poverty level.

[2] Given the +/- 9.82% error reported within the MPCA mapping tool, this tract is mapped as an EJ area for exceeding the following threshold: 35 percent or more of the households have an income at or below 200 percent of the federal poverty level.

[2] The MPCA includes the percent error when considering whether the census tracts meet the conditions of an environmental justice community.

8.1.1.1 Impacts and Mitigative Measures

Based on the data provided by the U.S. Census Bureau and MPCA, no census tracts within the Project Area have a minority population greater than 40 percent or a population greater than 40 percent with limited English proficiency. In addition, the Project Area does not cross federally recognized tribal areas. Given that the Facility already exists and includes both EJ and non-EJ communities, no adverse, disproportionate impacts are anticipated to result from the Project. Therefore, Elm Creek II does not propose mitigative measures.

8.2 Land Use and Zoning

Land cover and use within the Project Area is predominantly agricultural crops, with some deciduous and coniferous trees for windbreaks typically surrounding farmsteads (Map 6).

8.2.1 Local Zoning and Comprehensive Plans

As noted in Section 1, Elm Creek II previously obtained a Site Permit for the Facility in 2010. Pursuant to Minnesota Statutes, section 216F.07, a site permit issued by the PUC, "supersedes and preempts all zoning, building or land use rules, regulations or ordinances adopted by regional, county, local and special purpose governments." Therefore, Elm Creek II is not required to apply to county zoning authorities for additional permits or approvals for the Project. However, pursuant to Minnesota Statutes, section 216F.081, "The commission, in considering a permit application for LWECS in a county that has adopted more stringent standards, shall consider and apply those more stringent standards, unless the commission finds good cause not to apply the standards."

Table 8-4 provides a summary of setback requirements for Commercial Wind Energy Conversion Systems (WECS) in Martin County that have a combined nameplate capacity of 125 or more kilowatts (KW) and setback requirements for Jackson County from the 2022 Jackson County Development Code. Jackson County's code recognizes that projects larger than 25 MW are permitted solely by the PUC.

Table 8-4 Martin & Jackson County Setback Requirements for Commercial Wind Energy Conversion Systems (≥25 kW)

Wind Facility and Collector Lines Setback Categories	Martin County (Commercial Wind Energy Conversion Systems)[1]	Jackson County (Large Wind Energy Conversion System, LWECS) [2]	Project Conformance with Setback
Project Boundary /Property Lines / Participating Project Boundaries	1.1 times the total height	= to height of structure including blades	Conforms with setback
Non-participating Project boundaries	Not applicable	3 times rotor diameter on non-prevailing wind axis and 5 times rotor diameter on prevailing wind axis	Refer to Section 5.1
Dwellings, other than project owners	750' and sufficient distance to meet state noise standards The setback for new dwellings shall be reciprocal in that no dwelling shall be constructed within the same setback as a new wind turbine would need to meet to an existing dwelling.	750' and sufficient distance to meet state noise standards	Conforms with setback
Noise Standard	Minnesota Rule 7030, as amended	Minnesota Rule 7030	Conforms with setback
Road Rights-of-way	1.1 times the total height	= to height of structure including blades with a 250' minimum	Conforms with setback
Other Rights-of-way (railroads, recreational trails, powerlines, etc.)	1.1 times the total height	= to height of structure including blades with a 250' minimum	Conforms with setback
Public Conservation Lands	1.1 times the total height	Not applicable	Conforms with setback
Wetlands U.S. Fish and Wildlife Service (USFWS) Types III, IV, and V)	1.1 times the total height	= to height of structure including blades	Conforms with setback
Other structures	1.1 times the total height	1.25 the total height	Conforms with setback with one exception [3]
Other existing WECS and internal turbine spacing	Not applicable	3 times rotor diameter on non-prevailing wind axis and 5 times rotor diameter on prevailing wind axis	Refer to Section 5.1
Native Prairie	WECS and associated facilities shall not be placed in native prairie unless approved in a native prairie protection plan. A native prairie protection plan shall be submitted if native prairie is present. The permittee shall, with the advice of the Minnesota Department of Natural Resources (DNR) and any others selected by the permittee, prepare a prairie protection and management plan and submit it to the County and DNR Commissioner sixty (60) days prior to the start of construction.	Not applicable	Conforms with requirement
Sand and Gravel Operations	WECS shall be prohibited in active sand and gravel operations.	Not applicable	Conforms with requirement
Aviation (public and private airports)	No WECS shall be located so as to create an obstruction to navigable airspace of public and private airports in the County. Setbacks or other limitations determined in accordance with Department of Transportation (DOT) Department of Aviation and Federal Aviation Administration (FAA) requirements.	Not applicable	Elm Creek II has obtained a Determination of No Hazard for each turbine and will obtain ADLS approvals prior to construction (Appendix D).
Essential Services	Substations, accessory facilities, and power lines associated with the WECS not located within a public right-of-way or any utility easement required by the Zoning Ordinance shall meet Chapter 24 Subdivision 6 as regulated in the Zoning Ordinance.	Not applicable	Conforms with requirement
Shoreland District	Commercial wind turbines shall be prohibited within the Shoreland District.	Not applicable	Conforms with requirement

[1] reference (14)
[2] reference (15)
[3] Jackson County's setback for "other structures" is 1.25 times the height of the structure. The existing turbine is 417 feet high (equates to a 521.25-foot setback). The retrofitted turbine would be up to 477 feet high (equates to a 596.25-foot setback). Nonresidential, agricultural structures were identified approximately 545 feet from Turbine R5. If this turbine is retrofitted, it would not be in conformance with Jackson County's setback for other structures.

Table 8-5 provides a summary of governing bodies within and adjacent to the Project Area and their respective comprehensive plans.

Table 8-5 Governing Bodies within and Adjacent to the Project Area

Governing Body	Name of Plan	Year Adopted	Associated Development Plans
Jackson County	Jackson County Comprehensive Plan	2010	Jackson County Development Code Adopted April 12, 1993 Revised in 1994, 1998, 2001, 2002, 2009, 2010, 2012, 2014, 2015, 2017, 2022
Martin County	Martin County Land Use Plan	2003	Martin County Zoning Ordinance Adopted August, 2008 Renewable Energy Ordinance Effective date July 21st, 2015
Enterprise Township	None Adopted	NA	Jackson County Comprehensive Plan
Wisconsin Township	None Adopted	NA	Jackson County Comprehensive Plan
Elm Creek Township	None Adopted	NA	Martin County Land Use Plan
Cedar Township	None Adopted	NA	Martin County Land Use Plan
Jay Township	None Adopted	NA	Martin County Land Use Plan

Jackson County's Comprehensive Plan states that it has, "become an attractive location for wind energy development with growth of the industry along Southwest Minnesota's Buffalo Ridge," and includes reference to existing wind energy facilities at the time of the plan, including Trimont and Elm Creek (reference (16)). Martin County's Land Use Plan does not address renewable energy facilities (reference (17)).

8.2.2 Impacts and Mitigative Measures

The Project will not result in changes to the Facility layout and conforms to local setback requirements noted in Table 8-4. As such, no impacts will occur to existing land uses and no mitigative measures are proposed.

8.3 Conservation Easements

Conservation easements are properties that have been either sold or volunteered under a legal agreement by a landowner to a qualified conservation organization (land trust or government agency) that limits or conditions certain types of use of the land to fulfill the conservation purpose of the easement. The following conservation easement programs are common in Minnesota:

- Conservation Reserve Program (CRP);
- Conservation Reserve Enhancement Program (CREP);
- Reinvest in Minnesota (RIM);
- Wetlands Reserve Program (WRP); and
- Permanent Wetland Preserves (PWP).

Based on publicly available GIS data, no easements within the Project Area overlap with existing structures or utility features. However, there are five CREP I easements, six CREP III easements, and one RIM easement in the northeast part of the Project Area (Map 7). One CREP area is immediately adjacent to the existing Facility and became part of the program in 2018 after Facility construction (Map 7). This CREP location is collocated with the Elm Creek 5 DNR Site of Biodiversity Significance (SBS) as discussed in Section 8.21 of this Application. CREP is an offshoot of the CRP which is a land conservation program established by the U.S. Department of Agriculture (USDA) and administered by the Farm Service Agency that pays farmers a yearly rental fee for agreeing to take environmentally sensitive land out of agricultural production to improve environmental health and quality (reference (18)). Minnesota implemented the CREP to target state-identified, high-priority conservation resources by offering payments to farmers and agricultural landowners to retire environmentally sensitive land using the RIM Program (reference (19)).

8.3.1 Impacts and Mitigative Measures

The Facility is not located within any conservation easements. No direct impacts are anticipated. Although adjacent to one CREP location, Elm Creek II will avoid all impacts per the discussion found in Section 8.21.2. A Stormwater Pollution Prevention Plan (SWPPP) will be developed for the Project that outlines erosion and sediment control measures to be installed during construction, which will minimize the potential for sedimentation outside of construction workspaces, including sensitive resources such as the adjacent CREP.

8.4 Sound

8.4.1 Existing Sound Levels

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." Sound is an audible variation of air pressure and can vary in both intensity and frequency. The intensity of a sound wave is measured on a logarithmic scale in units called decibels (dB). Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight." The A-weighted scale (dBA) is used to align with the selective sensitivity of human hearing. The A-weighting deemphasizes sounds at lower and very high frequencies because the human ear is less sensitive to sound at these frequencies at low magnitude.

The term "background or ambient noise," as described in the Minnesota Pollution Control Agency (MPCA's) Guide to Noise Control in Minnesota, refers to all noise sources other than the noise source of

concern. Common background sound sources within an agricultural and/or rural environment include, but are not limited to, sound from farm equipment such as tractors and combines, sound generated from traffic on roadways, sounds from birds, and wind rustling through the vegetation.

As the Project Area is in an agricultural land use setting, there are existing sources of sound associated with agricultural activity. Interstate Highway 90 passes along the southern portion the Project Area as well as numerous county roads (CRs) within and nearby the Project Area, that also provide a source of sound to the area with the frequent use by freight truck and automobile traffic. There are existing turbines from other wind facilities near the Project Area.

8.4.2 Sound Standards

The Project is subject to sound requirements provided in Minnesota Rules, Chapter 7030 for Noise Pollution Control. The standards are grouped according to land activities in the noise area classification (NAC) as defined by Subpart 2 of Minnesota Rules, part 7030.0050. The standards provided in Minnesota Rules are noted in Table 8-6. The MPCA standards require A-weighted noise measurements. The 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. Each daytime and nighttime group is further broken out into L_{10} and L_{50} standards that refer to the timeframe of the sound. Where L_{10} refers to the sound level (dBA) which is exceeded ten percent of the time for a one-hour survey, and L_{50} refers to an exceedance of 50 percent of the time for a one-hour survey. In other words, the noise standards specify the maximum allowable noise volumes that may not be exceeded for more than 10 percent of any hour (L_{10}) and 50 percent of any hour (L_{50}).

Table 8-6 Minnesota Daytime and Nighttime Sound Standards

Noise Area Classification	Daytime		Nighttime	
	L_{50}	L_{10}	L_{50}	L_{10}
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Source: Minnesota Rules, part 7030.0040, subpart 2.

Household units, including farmhouses, are within NAC-1. Identified receptors within the Project Area are governed by the NAC-1 limits. The Project Area is considered a NAC-1 with daytime noise allowances of 60 dBA and nighttime noise allowances of 50 dBA according to Minnesota Statutes, section 116.07 and Minnesota Rules Chapter 7030.

8.4.3 Impacts and Mitigative Measures

8.4.3.1 Construction Noise

Typical sound levels from construction activities are listed in the Federal Highway Administration's 2006 *Roadway Construction Noise Model User's Guide* and reproduced in Appendix E. Construction activities and noise will be temporary. Typical construction equipment will be utilized (e.g., heavy duty trucks, cranes,

loaders, and graders) and construction noise is expected to be limited when compared to the construction of the original Facility. Individual pieces of construction equipment will be equipped with mufflers as required by law and resulting sound levels are expected to be similar to large farm equipment used during planting or harvesting activities.

8.4.3.2 Operational Noise Modeling

Elm Creek II contracted Jacobs to conduct a sound modeling study to confirm that it is consistent with MPCA standards. The modeling was conducted using CadnaA by DataKustik GmbH, which is based on the International Organization for Standardization 9613-2 (ISO 9613-2), *Acoustics—Sound Attenuation During Propagation Outdoors Part 2: General Method of Calculation* (1996). A mixed ground condition (G=0.5) was used consistent with guidance published by National Association of Regulatory Utility Commissioners (Appendix E). Details of the study are further outlined in Appendix E.

The assumptions and inputs from the sound analysis include:

- The analysis conservatively assumes retrofitting up to 62 turbines with Vestas V120 Serrated Trailing Edge blades. Select turbines were modeled with their nighttime operations limited at higher wind speeds.
- Sound power levels representing the standard performance of the wind turbines were assigned based on International Electrotechnical Commission Standard 61400-11 data supplied by the manufacturers.
- All turbines within 2 miles of the Facility turbines were included to account for their potential contribution to the overall sound level.
- The analysis did not account for potential reductions afforded by screening from structures, terrain, or other features.
- The average background ambient nighttime L_{50} sound level measured was 29 dBA based on Facility post-construction monitoring conducted in 2011.

Daytime modeled sound levels at modeled receptors ranged from 29 to 47 dBA and nighttime ranged from 28 to 46 dBA (Appendix E). A summary of the number of modeled results within 5 dBA increments is presented in Table 8-7. As shown, the majority of receptors fall within the 38 to 42 dBA range for both daytime and nighttime modeled scenarios. Five receptors have a predicted sound level of 47 dBA for the daytime scenario, the highest predicted sound level modeled. These five receptors are all participating landowners, and are typically located in proximity to more than one turbine.

Table 8-7 Sound Pressure Level Summary

Sound Pressure Level (dBA)	Receptor Count	
	Daytime	Nighttime
28-32	13	14
33-37	26	31
38-42	41	39
43-47	35	31

The addition of the background sound level from the 2011 monitoring (29 dBA, refer to Appendix E) to predicted turbine sound levels does not result in an increased total sound level that exceeds 60 dBA during the day nor 50 dBA during the night. For a hypothetical predicted turbine sound level of 50 dBA to result in a total sound level of 51 dBA, the background sound level would need to exceed 40 dBA. Similarly, for a predicted Project-only sound level of 49 dBA to result in a total sound level of 51 dBA, the background sound level would need to exceed 44 dBA. Sound levels of 40 to 44 dBA are over twice as loud as the measured average nighttime ambient background sound level of 29 dBA. Under high ground-level wind conditions, higher than average background sound levels are expected (Appendix E), and this higher level of wind-induced background noise may assist with masking wind turbine noise in some situations.

8.4.3.3 Sound Mitigative Measures

The Project will comply with the MPCA standards due to the Project design and operation, and turbines will remain set back more than 1,000 feet from residences. In addition, the repowered turbines will have sound mitigation in the form of Serrated Trailing Edge blades and select turbines will have limited operations at nighttime. Upon final selection of turbine model(s), Elm Creek II will provide a revised preconstruction sound assessment documenting compliance with MPCA noise standards. Elm Creek II will prepare a monitoring protocol for approval and conduct a post-construction sound level survey to evaluate compliance with the MPCA noise standards.

The proposed design and mitigative measures described above will effectively avoid and minimize impacts such that the Project will not cause adverse sound impacts and sound levels will not exceed the State of Minnesota's noise standards.

8.5 Visual Resources

8.5.1 Existing Visual Resources

Visual resources consist of features that provide aesthetic quality to a region. Visual resources include terrain, natural features, and landscapes such as lakes, rivers, and vegetation communities, and historical and cultural features. Martin and Jackson counties offer opportunities for tourism and recreational activities due to their rural landscape and natural features. The topography of the Project Area is relatively flat with gently rolling hills and ridges with elevations ranging from 1,248 to 1,430 ft above sea level.

Agricultural fields, farmsteads, fallow fields, large open vistas, and gently rolling topography visually dominate the Project Area. The landscape can be classified as rural open space. Local vegetation is predominantly agricultural crops and limited pasture. Crops include corn, soybeans, small grains, and forage crops, which visually create a low uniform cover. A mix of deciduous and coniferous trees planted for windbreaks surround many farmsteads. In the swales, there are occasional patches of native willows, cattails, and grasses.

In addition to the existing Facility, there are two existing wind farms (Trimont and Elm Creek) located immediately north of the Project and partially overlapping the Project Area (Map 8). The Trimont and Elm Creek Wind facilities have a combined total of 133 turbines (reference (20)). These turbines are most visually apparent from U.S. Highway 71, County State Aid Highways (CSAHs), CRs, and Interstate Highway 90. In addition, the Great River Energy (GRE) Lakefield Junction Station is a natural-gas combustion turbine power plant located on 150 ac in Section 19 of Cedar Township within the Project Area. It is a 488 MW peaking plant made up of six gas combustion turbines (reference (20)).

The following nearby cities are where most nearby residential neighborhoods and businesses are located. These cities also offer opportunities for tourism and recreational activities:

- The City of Jackson (population 3,310)
- The City of Trimont (population 709)
- The City of Sherburn (population 1,061)
- The Town of Alpha (population 98)

Interstate Highway 90 is the closest Interstate Highway, near the southern border of the Project Area.

8.5.2 Impacts and Mitigative Measures

Turbines are an existing feature on the landscape, and because no new turbines will be built, the Project will not introduce new significant features to the landscape. The Project will result in a minimal visible permanent change with the addition of larger blades. The larger blades could increase the rotor swept area by up to 82 feet. Overall, the Project is not expected to change the existing natural quality of the areas near the Project and the aesthetic experience of the persons using those areas.

Additionally, the FAA requires obstruction lighting or marking of structures more than 200 feet above ground to provide safe air navigation, which is synchronized flashing of red lights for turbines. Elm Creek II obtained a Determination of No Hazard for each turbine location in May 2023 Appendix D. Elm Creek II received an extension for the determinations in November 2024. Elm Creek II is also coordinating with the FAA on lighting mitigation that may include an ADLS. As outlined in Section 6.3.3, ADLS is a lighting system that will activate flashing red lights on top of lighted turbines when an approaching aircraft is detected, and the flashing red lights will continue to flash until the aircraft clears the area. When an aircraft is not detected, the lights will not be lit. Based on an analysis of radar coverage from a FAA-approved ADLS technology vendor, the radar unit is currently proposed to be sited in the existing O&M yard and will not impact native prairie, wetlands or other sensitive resources; however, the final location of

the radar unit will be determined based on approval by the FAA, participating landowners and environmental conditions.

Due to the decrease in activated lighting in the Project Area, there will be decreased impacts to the visual surroundings.

8.5.3 Shadow Flicker

Shadow flicker occurs when rotating turbine blades move between the sun and the observer to create a flickering shadow as the blades rotate. For shadow flicker to occur, three conditions must be met: (1) the sun must be shining with insignificant cloud cover; (2) the rotor blades must be spinning and must be located between the receptor and the sun; and (3) the receptor must be sufficiently close to the turbine to be able to distinguish a shadow created by it. The flickering effect is most noticeable within approximately 1,000 m (3,280.8 ft) of the turbine and becomes more diffused by the atmosphere as the distance increases. Shadow flicker is generally strongest during the winter months and around sunrise/sunset when the angle of the sun is lower and can cast a longer shadow.

A shadow flicker assessment was completed and is included as Appendix F. The assessment used the SHADOW calculation module of the WindPRO software. To calculate shadow flicker levels at nearby residences, the WindPRO SHADOW calculation module takes into account the location of each receptor, the orientation of each side of the receptor, the location of each wind turbine, turbine hub height, turbine rotor diameter, elevation data of the specific analysis area, and data on the sun's path through the sky on each day of the year (Appendix F). Analysis of available cloud cover data indicated the sun would be unobstructed by clouds long enough to potentially create shadow flicker effects anywhere from 54 to 89 percent of the time during daylight hours on a monthly basis. Other factors that could limit the total amount of predicted shadow flicker, but were not taken into account in the modeling, include the following:

- Presence of haze or particulate matter in the air that tends to reduce the intensity of light and reduce distances at which shadows can be cast.
- Potential structures and vegetation located between receptors and the turbines, which would block shadows created by the rotating turbine blades and thus prevent shadow flicker from occurring at receptors.
- Size, location, and orientation of windows; the model assumes that the receptors are in the "greenhouse mode," in which the receptor is assumed to be all windows—a worst-case scenario.

A review of the annual shadow flicker exposure data indicates a predicted shadow flicker duration ranging from 0 to 63 hours/year. A summary of the number of reviewed receptors falling within 10-hour increments for annual shadow flicker is presented in Table 8-8. As shown, the majority of modeled receptors receive less than 10 hours of shadow flicker per year. Six receptors have the potential to experience shadow flicker for more than 30 hours/year. Of those six receptors, five are participating landowners and one is nonparticipating. The nonparticipating landowner is modeled with a total of 31.5 hours of annual shadow flicker. The highest duration of predicted shadow flicker is just under 63 hours/year for a participating landowner.

Table 8-8 Annual Hours of Shadow Flicker Summary

Annual Hours of Shadow Flicker (hours/year)	Receptor Count
0-10	95
10-20	6
20-30	8
>30	6

While there are no federal or state regulations prescribing shadow flicker limits, Elm Creek II strives to adhere to a limit of 30 hours of shadow flicker per year in accordance with the standard practice expected by the PUC. Elm Creek II will prepare a Shadow Flicker Mitigation Plan for receptors that exceed 30 hours/year of expected shadow flicker impacts unless an alternative agreement is reached. Elm Creek II will continue to evaluate any complaints received regarding flicker throughout the operation of the Facility. In coordination with the affected party, Elm Creek II will evaluate potential flicker minimization options in the unlikely event that significantly more flicker is present than was modeled.

8.6 Public Services and Infrastructure

8.6.1 Public Services

A 5-mile boundary around the Project Area was reviewed. Jackson and Martin County provide public services within the Project Area. The emergency response centers are in the City of Jackson for Jackson County and in the City of Fairmont for Martin County. They each dispatch 911 calls for the county, including for fire, medical, and police emergencies, for their respective counties. Rural Water District 1 provides the water supply to the Project Area. Households within the Project Area use septic systems to manage sanitary waste.

8.6.1.1 Impacts and Mitigative Measures

Construction and operation of the Project is expected to continue to have a minimal effect on existing public services and infrastructure in the area; therefore, mitigative measures are not proposed.

8.6.2 Roadways

8.6.2.1 Existing Roadways

Existing roadway infrastructure within the Project Area consists of township and CRs/highways. Interstate Highway 90 provides access to smaller roads and nearby communities and bisects the southern portion of the Project Area (Map 1).

Table 8-9 summarizes the traffic within the Project Area based on available Minnesota Department of Transportation (DOT) Average Annual Daily Traffic (AADT) counts. AADT data was not available for all roads within the Project Area. Interstate Highway 90 has the highest daily traffic levels within the Project Area (8,200 vehicles per day) and CSAH 140 has the lowest (18 vehicles per day).

Table 8-9 Existing Daily Traffic Levels

Road Segment	Traffic Volume	Year Data Collected
Interstate Highway 90	8,200	2018
CSAH 16	125	2016
CSAH 22	150	2016
CSAH 28	240	2016
CSAH 29	430	2016
CSAH 36	205	2022
CSAH 44	335	2022
CR 72	20	2008
CR 76	35-210	2008
CR 85	50	2008
CR 103	94	2022
CR 132	36	2022
CR 140	18	2022

Source: reference (21)

8.6.2.2 Roadway Impacts and Mitigative Measures

Temporary impacts may occur to public roads during the construction phase resulting from transport of materials and equipment using existing highways, CRs, and township roads. Some short-term traffic delays may occur during equipment delivery. However, the impacts from repowering will be considerably less than those that were experienced during initial construction of the Facility.

Construction activities will increase the amount of traffic using the local roadways, but it is not anticipated to result in adverse traffic impacts. Trucks, construction vehicles, and personal vehicles will likely use Interstate Highway 90 to access the Project Area. While the increase in vehicle traffic will contribute to the capacity of the roadways, it will not overburden roadways during the construction period. Elm Creek II will perform routine maintenance and roadway repairs in accordance with local road use agreements as a result of the Project construction activities. A maintenance crew will continue to use roads within and adjacent to the Project Area during operations. The low levels of operation, maintenance, and repair activities are not expected to adversely impact normal traffic in the Project Area; therefore, no additional mitigative measures are proposed during operation.

8.6.3 Communication, Television, and Broadband Systems

Point-to-point microwave transmission is a critical component of the national communications infrastructure. Microwave paths enable broadband data transmission that supports telephone, cellular, and personal communication service networks, wireless internet providers, and audio and video transmission, from television (TV) studios to transmitter sites, as well as many other industry and utility

applications. To provide signal reliability, these paths are located to avoid any line-of-sight obstructions. Proposed structures that create a line-of-sight obstruction can degrade signal reliability and could require revisions to the microwave system.

Microwave Paths

Capitol Airspace conducted a microwave path analysis for the Project Area in March 2024. Proposed structures that intersect a microwave link's Fresnel zone can create a line-of-sight obstruction that degrades link performance. Depending on the proposed structure type, the percentage of the Fresnel zone obstructed, and the microwave system configuration, this impact could degrade signal reliability and require revisions to the microwave system. The analysis used industry standard procedures and FCC Universal Licensing System (ULS) databases to identify existing microwave paths crossing the Project Area (Appendix G). Eight paths associated with two microwave links overlie the Project Area (Table 8-10).

Table 8-10 Summary of Microwave Path Analysis

Licensee	Call Sign	Path	Status	Transmitter	Receiver	Frequency
Federated Rural Electric Association	WRDI452	3	Licensed	Ellefson Grain Leg	Ploehn Grain Leg	10995.00
		4	Licensed	Ellefson Grain Leg	Ploehn Grain Leg	10995.00
	WRDJ351	1	Licensed	Ploehn Grain Leg	Ellefson Grain Leg	11485.00
		2	Licensed	Ploehn Grain Leg	Ellefson Grain Leg	11485.00
LTD Broadband LLC	WRBM460	1	Licensed	Steve Johnson Farms	Sherburn Water Tower	11645.00
		2	Licensed	Steve Johnson Farms	Sherburn Water Tower	11645.00
	WRBM461	1	Licensed	Sherburn Water Tower	Steve Johnson Farms	11155.00
		2	Licensed	Sherburn Water Tower	Steve Johnson Farms	11155.00

General Communication Overview

Capitol Airspace Group conducted a communications systems interference analysis in November of 2023 for the Project (Appendix H). The purpose was to identify Amplitude Modulation (AM) and Frequency Modulation (FM) radio, TV, and land mobile radio (LMR) systems that could be affected by the Project. Other communication towers in proximity to the Project were also identified.

AM and FM radio, along with TV stations, are a critical component of the national communications infrastructure. These stations broadcast emergency, news, music, entertainment, and educational content. LMR systems play a critical role in enabling seamless communication among public safety agencies, emergency responders, and transportation services, ensuring swift and coordinated responses to urgent

situations and enhancing overall public safety nationwide. Structures that interfere with these systems can degrade the services that they provide.

Wind turbines have the potential to disrupt communication systems through two primary mechanisms: physical obstruction of the signal path as well as electromagnetic interference. The likelihood of disruption depends on the characteristics of the radio frequency signal and the proximity of wind turbines to communication system components.

Wind turbines located within 6 kilometers (km) (3.7 miles) of a transmitting AM facility have the potential to adversely affect AM transmissions. This interference could cause the transmitting entity to be out of compliance with their FCC license. No transmitting AM facilities are located within 6 km (3.7 miles) of the study area. The closest AM station to the Project is KKOJ(AM), which is 17.65 km (10.9 miles) from the nearest turbine.

Wind turbines located within 1 km (0.6 miles) of a transmitting FM facility have the potential to adversely affect FM transmissions. There are no transmitting FM facilities located within 1 km (0.6 miles) of the study area. The nearest FM stations to the Project are collocated FM Translator K249EO and FM station KUXX(FM), which are 8.18 km (5.1 miles) from the nearest turbine.

Wind turbines located within 2 km (1.2 miles) of a transmitting TV facility have the potential to adversely affect over the air (or digital) TV transmissions. However, no transmitting TV facilities are located within 2 km (1.2 miles) of the Project; the closest TV transmitters are 10.8 km (6.7 miles) away.

Wind turbines have the potential to disrupt TV reception due to the reflections and multipath effects induced by the motion of wind turbine blades. These disruptions typically occur at the TV frequencies and at the receiver location when the wind turbine is positioned between the TV station transmitter location and the receiver. This interference may become more pronounced in areas where the received TV signal is already weak. Given the complexity of predicting such interference, an evaluation was conducted on TV facilities located within 175 km (108.7 miles) of the study area to assess potential coverage overlaps.

Table 8-11 summarized 18 TV stations with coverage contours that overlap the study area.

Table 8-11 TV Stations with Coverage Contours Overlapping the Project

Licensee	Call Sign	Status	Coordinates	Distance to Nearest Turbine (km)
Cooperative Television Association of Southern Minnesota	K17MY-D	License	43 36 53.80 N, 94 57 49.00 W	10.8
Federated Rural Electric Association	K35Iz-D	License	43 36 53.80 N, 94 57 48.90 W	10.8

Licensee	Call Sign	Status	Coordinates	Distance to Nearest Turbine (km)
Blue Earth-Nicollet Faribault Cooperative Electric Association	K34NU-D	License	43 36 12.00 N, 94 59 34.00 W	10.8
Blue Earth-Nicollet Faribault Cooperative Electric Association	K31NT-D	License	43 36 12.00 N, 94 59 34.00 W	10.8
Federated Rural Electric Association	K19HZ-D	License	43 36 12.00 N, 94 59 34.00 W	10.8
Federated Rural Electric Association	K22MY-D	License	43 36 12.00 N, 94 59 34.00 W	10.8
Federated Rural Electric Association	K23FO-D	License	43 36 12.00 N, 94 59 34.00 W	10.8
Cooperative Television Association of Southern Minnesota	K30KQ-D	License	43 36 12.00 N, 94 59 34.00 W	10.8
Federated Rural Electric Association	K27NF-D	License	43 36 12.00 N, 94 59 34.00 W	10.8
Cooperative Television Association of Southern Minnesota	K2801-D	License	43 36 12.00 N, 94 59 34.00 W	10.8
Federated Rural Electric Association	K29LV-D	License	43 36 12.00 N, 94 59 34.00 W	10.8
Gray Television Licensee, LLC	KMNF-LD	License	43 56 12.30 N, 94 24 39.00 W	39.3
Gray Television Licensee, LLC	KEYC-TV	License	43 56 13.0 N, 94 24 39.00 W	39.3
Cooperative Television Association of Southern Minnesota	K14KE-D	License	44 06 25.00 N, 94 35 45.00 W	43.6
Cooperative Television Association of Southern Minnesota	K26CS-D	License	44 06 25.00 N, 94 35 45.00 W	43.6
Cooperative Television Association of Southern Minnesota	K30FN-D	License	44 06 25.00 N, 94 35 45.00 W	43.6

Licensee	Call Sign	Status	Coordinates	Distance to Nearest Turbine (km)
Cooperative Television Association of Southern Minnesota	K34JX-D	License	44 06 25.00 N, 94 35 45.00 W	43.6
West Central Minnesota Educational TV Corporation	KSMN-TV	License	43 53 52.00 N, 95 56 51.00 W	84.9

Wind turbines located within 100 m (62.1 miles) of a fixed land mobile base station have the potential to adversely affect two-way radio communications. None of the proposed wind turbines are located within 100 m (62.1 miles) of any Land Mobile base station.

Wind turbines within 100 m (62.1 miles) of a tower-mounted cell phone radio could adversely affect cellular service and communications. There are no communications towers within 100 m (62.1 miles) of a planned wind turbine location.

8.6.3.1 Impacts and Mitigative Measures

Microwave Paths

Using FCC ULS database antenna heights, three-dimensional analysis indicates that the T1, T2, and U3 rotor-swept volumes will intersect the LTD Broadband LLC Steve Johnson Farms to Sherburn Water Tower link's Fresnel zones (Appendix G). The intersected LTD Broadband LLC was licensed in 2018 after the construction of the Project in 2010 and currently interacts with existing MHI Turbines T1, T2, and U3. As a result, Elm Creek II will coordinate directly with the LTD Broadband LLC should conflicts from repowering Turbines T1, T2, and U3 impact signal reliability. The remaining 59 locations are not anticipated to obstruct any licensed or applied non-federal microwave links.

General Mitigative Measures

No impacts to AM/FM radio or cellular services are expected given the applicable infrastructure's proximity to turbine locations.

Television services could be subject to interference if the TV transmitter and receiver are located within direct line-of-sight with a wind turbine. Mitigation options would include simple changes to the placement of the receiving antenna or providing alternate means of viewing TV such as cable, satellite, or internet TV subscriptions. If the Project does result in TV reception interference, resolutions will be addressed on a case-by-case basis by Elm Creek II and services will be restored.

Any LMR interference should be temporary since they are normally in motion. Handheld radio users will typically move the handheld when encountering interference of the type that wind turbines are likely to cause.

Avangrid will not operate the Project to cause TV interference contrary to FCC regulations or other law. There have been no complaints since the original Facility construction related to communications services. Interference with nearby communication systems is not expected; therefore, no mitigative measures are proposed.

8.7 Cultural and Archaeological Resources

Cultural resources consist of archaeological resources, historic architectural resources, and traditional cultural properties.

Pursuant to Minnesota Rules, part 7854.0500, subpart 7(e), the applicant for a Site Permit must include an analysis of the potential impacts of the Project to cultural and archaeological resources. The Project is also subject to the Minnesota Historic Sites Act (Minnesota Statutes, sections 138.661 to 138.669) and the Field Archaeology Act (Minnesota Statutes, sections 138.31 to 138.42). The Minnesota Historic Sites Act (Minnesota Statutes, sections 138.661 to 138.669) requires that state agencies consult with the State Historic Preservation Office (SHPO) before undertaking or licensing projects that may affect properties on the State or National Registers of Historic Places. The Minnesota Field Archaeology Act (Minnesota Statutes, sections 138.31 to 138.42) establishes the position of State Archaeologist and requires State Archaeologist approval and licensing for any archaeological work that takes place on non-federal public property.

8.7.1 Existing Cultural and Archaeological Resources

Elm Creek II completed a Phase Ia cultural resources literature review and report (Phase Ia) for the Project in September 2023 (Appendix I). The Phase Ia found that the Project Area was investigated for archaeological resources as part of a Phase I archaeological reconnaissance completed for the construction of the Facility (PUC Docket: IP6728/WS-09-553) in 2010. A review of the approximated Project construction footprint as compared to the Facility's 2010 survey limits indicates that 98.5 percent of the approximated construction footprint was surveyed in 2010.

The Phase Ia included a data request to the SHPO on April 24, 2023 and an in-person records check on June 13, 2023. The Minnesota Office of the State Archaeologist (OSA) portal for archaeological sites was also reviewed on June 13, 2023.

The data provided by SHPO and viewed through the OSA portal indicate that within the Project Area, two archaeological sites have been documented. No historic architectural resources or other cultural resources, such as cemeteries, were documented within the Project Area. Within 1-mile of the Project Area, one additional archaeological site and 37 historic architectural resources have been documented.

The previously identified archaeological sites within the Project Area consist of a lithic isolate that was recommended not eligible for the National Register of Historic Places and an alpha site that documents the possible location of a historic trading post. Alpha sites have not been confirmed by formal archaeological survey, but generally represent locations where an archaeological site is anticipated based on some level of historic documentation.

The Phase I archaeological reconnaissance completed in 2010 found no evidence of the alpha site within the Project footprint and recommended the lithic isolate not eligible for the National Register of Historic Places. SHPO concurred with the findings and recommendations of the 2010 Phase I archaeological reconnaissance; therefore, no additional archaeological work or site avoidance was required in order for the Project to proceed.

8.7.2 Impacts and Mitigative Measures

Elm Creek II submitted the Phase Ia report to the Minnesota SHPO on September 6, 2023. The Phase Ia determined that 98.5 percent of the approximated construction footprint was surveyed for cultural resources in 2010 for the Facility construction. No significant archaeological or cultural resources were identified within the Project Area as a result of this investigation.

On November 7, 2023, the Minnesota SHPO responded via letter and commented on the Project pursuant to its responsibilities under the Minnesota Historic Sites Act (Appendix J). The Minnesota SHPO concluded that no properties listed in the National or State Registers of Historic Places and no significant archaeological resources will be affected by the Project. The Minnesota SHPO further stated that no additional archaeological survey is warranted for the Project as it is currently proposed in the report, but any substantial changes would require further review and consultation.

No additional cultural resources work is recommended for Project activities located within the original boundaries of the Facility footprint surveyed in 2010. Elm Creek II anticipates completing a Phase I archaeological reconnaissance in Spring of 2025 for the proposed crane paths and laydown yards located outside of the Facility footprint. Elm Creek II will submit the report to the Minnesota SHPO for review and comment in advance of construction activities.

Due to the previously surveyed nature of the Project Area and lack of identified cultural resources, no specific mitigative measures are proposed for the Project. If a significant cultural and/or archaeological resource is identified within the final area subject to disturbance to complete the Project, Elm Creek II will work with the Minnesota SHPO, OSA, and Tribes as needed regarding avoidance or specific mitigative measures that should be implemented for that resource.

As part of the outreach for the Project, Elm Creek II sent introductory letters to agencies and tribes in September 2023. Recipients included the Minnesota OSA, the Minnesota Indian Affairs Council, the 11 federally recognized tribes in Minnesota, and tribes expressing an interest in the site location. Elm Creek II received two responses from Shakopee Mdewakanton Sioux Community and Flandreau Santee Tribal Historic Preservation and followed up with both as noted in Appendix J. There are no outstanding questions or requests with tribes at this time.

It is anticipated that measures described above will effectively avoid and minimize impacts such that the Project will not cause adverse effects to cultural and/or archaeological resources.

8.8 Recreation

8.8.1 Existing Recreational Resources

Within the vicinity of the Project Area, a variety of recreational opportunities are available including hiking, fishing, hunting, camping, snowmobiling, and nature viewing. Elm Creek II reviewed information from the U.S. Fish and Wildlife Service (USFWS), Minnesota Department of Natural Resources (DNR), Martin, Jackson, Cottonwood, and Watonwan counties to identify recreational resources near the Project Area that are publicly accessible. The following resources are located within 10 miles of the Project (Map 9):

- Wildlife Management Areas (WMAs)
- Aquatic Management Areas (AMAs)
- Waterfowl Protection Areas (WPAs)
- State Parks
- Public Water Access Sites
- Lakes and waterways
- County/local parks
- Parks/public trails
- Snowmobile trails

The State of Minnesota established WMAs to protect and manage lands and waters for wildlife production, public hunting, trapping, fishing, and other recreational activities. Minnesota has approximately 1,500 WMAs, consisting of over 1.3 million ac of public land (reference (22)). Artz WMA is located within the Project Area and additional WMAs are located within ten miles of the Project as summarized in Table 8-12.

Table 8-12 Wildlife Management Area's within 10 miles of the Project

Wildlife Management Area Name	Distance from Project Area (Miles)
Artz WMA	0 (within Project Area)
Caron WMA	1.5
Fossum WMA	3.3
Four Corners WMA	4.0
Fox Lake WMA	4.3
Seymour Lake WMA	5.0
Rooney Run WMA	6.0
Bootleg Lake WMA	6.3
Laurs Lake WMA	6.4
Summers WMA	7.0
Toe WMA	7.5
Sulem Lake WMA	7.7
Bennett WMA	7.7
Krahmer WMA	7.9
Regehr WMA	8.2
Dead Horse WMA	8.9
Caraway WMA	8.9
Banks WMA	9.1
Turtle WMA	9.2

WPAs are public lands managed by USFWS for the purpose of preserving habitat for waterfowl and other wildlife. These areas are typically wetlands or grasslands that provide roosting and nesting habitat for waterfowl. Most of these federally managed wetlands and surrounding uplands are open to hunting (reference (23)). There are no WPAs within the Project Area, but there are 16 WPAs within 10 miles of the Project (Table 8-13).

Table 8-13 USFWS Waterfowl Production Area within 10 Miles of the Project

USFWS Waterfowl Production Area Name		Distance from the Project (Miles)
Boot Lake Waterfowl Protection Area (WPA)		6.5
Christiania WPA		7.9
Mountain Lake WPA		9.6
Holmes Lake WPA		9.9
Windom Wetland Management District	Unnamed WPA 1	1.5
	Unnamed WPA 2	2.0
	Unnamed WPA 3	2.0
	Unnamed WPA 4	2.2
	Unnamed WPA 5	2.9
	Unnamed WPA 6	3.0
	Unnamed WPA 7	7.0
	Unnamed WPA 8	7.8
	Unnamed WPA 9	8.4
	Unnamed WPA 10	9.0
	Unnamed WPA 11	9.4
	Unnamed WPA 12	9.7

AMAs provide angler and management access, protect critical shore land habitat, and provide areas for education and research. They are used for angling, non-motorized travel, wildlife observation, hunting, and trapping (reference (24)). There are two AMAs located within ten miles of the Project (Table 8-14).

Table 8-14 Aquatic Management Area's within 10 miles of the Project

Aquatic Management Area Name	Distance from the Project (Miles)
Big Twin Lake AMA (Martin)	3.2
Clam Lake AMA (Martin)	7.0

SNAs are lands that are set aside for scientific study and to promote public understanding. They may consist of native plant and animal communities, rare species, and areas of significant biodiversity. The goals of the SNA program are to preserve Minnesota's natural heritage and to protect and preserve those natural features that possess exceptional scientific or educational value (reference (25)). There are three SNAs located within 10 miles of the Project (Table 8-15).

Table 8-15 Scientific and Natural Areas within 10 miles of the Project

Scientific and Natural Area Name	Distance from the Project (Miles)
Prairie Bush Clover	6.0
Holthe Prairie	6.4
Des Moines River	8.6

There are several lakes, rivers and streams that are commonly used for recreational activities, such as boating, fishing, and swimming within ten miles of the Project. The Des Moines River is a designated State Water Trail which the DNR has mapped as a waterway suitable for paddling (kayaking or canoeing). While there are no Public Water access sites in the Project Area, there are 22 within 10 miles of the Project (Table 8-16). Surface water resources are further discussed in Section 8.17.

Table 8-16 Public Water Access Sites within 10 miles of the Project

Public Water Access Sites	Distance from the Project (Miles)
Des Moines River, Ashley Park Public Water Access Site	2.6
Fish Lake Public Water Access Site	3.6
Big Twin Lake Public Water Access Site	3.9
Cedar Lake Public Water Access Site	3.9
Temperance Lake Public Water Access Site	5
Des Moines River, Belmon Public Water Access Site	5.6
Independence Lake Public Water Access Site	6.2
Boot Lake Public Water Access Site	6.8
Clear Lake (N) Public Water Access Site	7
Fox Lake (SE) Public Water Access Site	7.2
Clam Lake Public Water Access Site	7.2
Fox Lake (NE) Public Water Access Site	7.4
Laur's Lake (W) Public Water Access Site	7.4
Clear Lake (S) Public Water Access Site	7.7
Sulem Lake Public Water Access Site	7.9
Des Moines River, Petersburg Public Water Access Site	8.2
Fish Lake (SE) Public Water Access Site	9.2
Kansas Lake Public Water Access Site	9.3
Des Moines River, Chris Public Water Access Site	9.3
Long Lake Public Water Access Site	9.5
Fish Lake (NW) Public Water Access Site	9.6
Fish Lake (S) Public Water Access Site	9.6

Parks and public trails are publicly managed lands that provide outdoor recreational opportunities to the public. There are 18 county or local parks within 10 miles of the Project (Table 8-17). Many of the parks have amenities that could include: a public boat access, picnic shelters and tables, playgrounds, ball fields, swimming areas, hiking and nature trails, and campgrounds.

Table 8-17 Local or County Parks and Recreation Areas within 10 miles of the Project

Local or County Park and Recreation Area Name	Distance from the Project (Miles)
Alpha Community Park	0.4
Ashley Park	2.5
Patterson Park	2.5
Gettys Park	2.6
Dann's Island Wayside Park	2.9
Central Park	3
Benes Recreation Area	3.1
Dumont Park	3.1
Sunset Park	3.5
Fort Belmont City Park	3.7
Cedar Hanson Park	4.1
Belmont Park	4.7
Anderson Park	4.9
Triumph Memorial Park	5.2
Mountain County Park	7.7
Long Lake Wayside Park	9.4
Mountain Lake City Park	9.6
Welcome Park	9.8

Snowmobiling is a popular recreational activity throughout Minnesota, with state-designated trails traversing most of the state. Although the trails are state-designated, local snowmobile clubs monitor and maintain most trails. The Cottonwood and Jackson County Snowmobile Trail is located along the southern boundary of the Project Area and over a mile away from the nearest turbine. The only other snowmobile trail within a 10-mile boundary of the Project is the Riverside Trail, located 3.3 miles north of the Project Area by Odin, MN (reference (26)).

8.8.2 Impacts and Mitigative Measures

Construction and operation of the Project is not anticipated to affect public access to, or enjoyment of, nearby recreational opportunities due to the avoidance of WMAs, WPAs, SNAs, AMAs, Public Water Access Sites, local and county parks, and snowmobile trails. The nearest existing turbine at the Project is 0.20 mi southeast of the Artz WMA. Turbines Q3 and Q4 do not comply with wind access buffer setbacks given the increased rotor diameter. Accordingly, Elm Creek II is coordinating with the DNR on the potential to enter into a wind rights agreement. If a wind rights agreement is not achieved with the DNR, Elm Creek II will continue to comply with the wind access buffer setbacks associated with the Artz WMA with existing infrastructure. Any nominal impacts, such as construction related noise or increased traffic, will be temporary and limited to the construction period. Therefore, no mitigative measures are proposed.

8.9 Public Health and Safety

This section describes potential impacts to public health and safety associated with electromagnetic fields (EMFs) and stray voltage and aviation, as well as other safety and security considerations.

8.9.1 Electromagnetic Fields and Stray Voltage

EMFs are invisible lines of force that surround any electrical device such as power lines, electrical wiring, and electrical equipment (reference (27)). EMFs at wind farms can originate from power lines, insulated power cables, transformers and electrical collection systems. As it relates to the Project, insulated power cables and transformers will be housed within the turbine itself. The transformers will be located in the nacelle approximately 85 m above ground. Research indicates that EMF will dissipate and be no more than background levels within 7 feet from the base of the turbine (reference (28)). EMFs from electrical collector and feeder lines dissipate quickly and relatively close to the source because they are typically buried underground, heavily insulated, and shielded.

Multiple studies show EMF levels in the vicinity of wind turbines are comparable to fields produced by standard household electrical devices and international safety standards (references (28); (29)). In addition, the National Institute of Environmental Health Sciences has conducted extensive research on EMFs (reference (30)). There is no conclusive research evidence that EMFs from power lines and wind turbines pose a significant health impact. The turbines were originally installed beyond the minimum allowable distances from occupied residences and no turbines are sited closer than 1,000 feet from an occupied residence.

Stray voltage is a natural phenomenon that is the result of low levels of electrical current flowing between two points not directly connected. Stray voltage associated with electrical infrastructure can result from improper grounding. The Project will continue to be properly grounded.

8.9.1.1 Impacts and Mitigative Measures

Based upon current research regarding EMFs, and the separation distances being maintained between transformers, turbines, and collector lines from public access and occupied residences, EMFs associated with the Project are not expected to have an impact on public health and safety.

Current electrical equipment is grounded in accordance with ANSI and NESC guidelines to promote safety and reliability. Correctly connecting and grounding electrical equipment prevents potential issues related to stray voltage. Stray voltage is typically not associated with underground electric collector lines that connect to the Project interconnection because they are not subject to other uses.

Because no new transmission lines are being built as a result of the repowering, there are no new impacts to the Project Area and its surrounding area. If needed, new underground collector lines and capacitor banks will be grounded properly in accordance with industry standards. Therefore, no mitigative measures are proposed.

8.9.2 Aviation

Based on a review of the FAA Airport Data database (reference (31)), there are active airports near the Project (Table 8-18). There are no registered public or private airports within the Project Area. The closest registered airport is 2.1 miles southwest of the Project. The Project Area is predominantly agricultural; therefore, crop-dusting activities within or near the Project via small private runways may occur.

Table 8-18 Airports Within 10 Miles of the Project

Airport Name	Facility Use	City	County, State	Distance from Project	Runway and Helipad Information	Runway Elevation
Jackson Municipal Airport (MJQ)	Public	Jackson	Jackson, MN	2.1 miles	1 Turf, 1 Asphalt	1,447 ft
Sanford Jackson Medical Center Heliport	Private	Jackson	Jackson, MN	3.2 miles	45 ft by 45 ft Concrete	1,450 ft
Turner Field – 40 MN	Private	Bingham Lake	Cottonwood, MN	8.7 miles	1 Turf	1,410 ft

8.9.2.1 Impacts and Mitigative Measures

Under 14 CFR Part 77.9, all structures exceeding 200 feet above ground level (AGL) must be submitted to the FAA for an aeronautical study to determine whether the structures may be a hazard to air navigation. The result of the aeronautical study is the issuance of a determination of 'hazard' or 'no hazard.' Additionally, a Tall Towers Permit and approval may be necessary from DOT prior to developing the Project to confirm the safety of airspace within Minnesota. A permit from DOT is necessary for any of the following:

- Structure is greater than 500 feet AGL;
- Structure is more than 200 feet AGL within 3 nautical miles of an airport and increasing by 100 feet for each additional mile out to six miles or 500 feet;

- Structure increases an instrument approach minimum flight altitude or increase its flight visibility minimums;
- Structure increases the minimum obstruction clearance altitude of a federal airway; or
- Structure penetrates any of the following imaginary surfaces: primary, horizontal, conical, approach, or transitional surfaces.

Elm Creek II obtained a Determination of No Hazard from the FAA for each turbine and MET tower prior to Facility construction. Elm Creek II has obtained updated FAA Determinations of No Hazard for each repowered turbine. A summary table has been included as Appendix D. To avoid potential impacts to air traffic, turbines have marking and lighting complying with FAA requirements.

The private airports and crop dusters in the area have continued operations alongside the Facility since its development in 2010. While the wind turbines may not be new to the landscape, the Project will result in an increase in rotor diameter and tip height of the turbines. Elm Creek II will notify private airports and landowners within the Project Area to reduce the risk to private airports and aerial spraying activities.

The proposed mitigative measures described above will effectively avoid and minimize impacts. The Project will not result in adverse impacts to aviation.

8.9.3 Other Safety and Security

The Project Area is within a predominately rural and sparsely populated area of Jackson and Martin counties. Section 8.1 describes existing demographic conditions, and Section 8.6.1 describes the public services within the Project Area.

8.9.3.1 Impacts and Mitigative Measures

Potential safety and security impacts associated with the construction of the Project include human emergencies and accidents, natural hazards, hazardous materials incidents, and traffic accidents. Potential safety and security impacts associated with the operation of the Project, though rare, include: danger of falling ice; unauthorized access to electrical and mechanical components of turbines; and turbine malfunction and/or collapse. The Project complies with required setbacks that will minimize potential safety and security impacts. Elm Creek II will regularly inspect and maintain each turbine in good condition.

With the low overall population density in the area, impacts to safety and security of the local population from construction and maintenance are not expected. Existing safety protocols for the Facility including conformance to safety standards will continue to be followed.

8.10 Hazardous Materials

The land use in the Project Area is predominantly agricultural. Hazardous materials within the Project Area may include petroleum products (fuel, gasoline, lubricants, propane, heating oil, and other maintenance

chemicals), pesticides, and herbicides used during agricultural activities. Polychlorinated biphenyls associated with pad-mounted and pole-mounted transformers may also be present.

Within the Project Area are three high-voltage transmission lines, several underground pipelines, a gas compressor facility, the GRE Lakefield Junction Station, Xcel Energy Lakefield Generation Substation, and parts of the Trimont and Elm Creek Wind Projects. The GRE Lakefield Junction Station includes lubricating oil, fuel oil, batteries, and other materials. The Trimont and Elm Creek O&M facility includes small quantities of hydraulic oil, lubricating oil, grease, and cleaning solvent. The substation transformers and pad-mounted transformers include mineral oil.

8.10.1 Impacts and Mitigative Measures

There is potential for spills and/or leaks due to the presence of hazardous materials during construction and operations. These spills and/or leaks could potentially impact surface and ground water and cause soil contamination within the Project Area. To minimize and/or avoid impacts to water and soil resources, the contractor will use appropriate measures including a secondary containment system for hazardous waste. Secondary containment will contain any leaks, if they occur, and prevent them from contacting soil, water, or other natural resources. Elm Creek II will update its existing spill prevention, control, and countermeasure plan (SPCC) for the Facility resulting from the construction and operation of the Project, if applicable, based on the requirements specified in 40 CFR 112 detailing the appropriate storage, cleanup, and disposal methods for hazardous waste to avoid and/or minimize potential impacts. Elm Creek II and its contractors will handle and dispose of any wastes generated during any phase of the Project in accordance with Minnesota Rules, chapter 7045, local rules and regulations, and the site-specific SPCC. Trained and qualified personnel will conduct any monitoring, transportation, or handling of hazardous materials using established procedures and proper equipment.

The proposed mitigative measures described above will effectively avoid and minimize impacts. As such, the Project is not expected to result in adverse environmental impacts due to hazardous materials.

8.11 Land-Based Economies

Land use within the Project Area is predominantly cultivated cropland (91.7 percent). Cultivated cropland accounts for most of the land within the Project Area (Map 6). According to the 2017 USDA Agricultural Census Report, 98.5 percent of the land in Martin County (roughly 449,064 ac) was classified as farmland, including 911 farms (reference (4)). In Jackson County, 79.2 percent of the land (roughly 356,306 ac) was classified as farmland, including 445 farms (reference (32)). Primary crops grown in both counties are corn and wheat, while cattle and swine are the predominant livestock raised in both counties. The market value of agricultural products sold in Martin County for 2017 was approximately $635.52 million, with crop revenue at approximately $265.67 million and livestock revenue at approximately $369.86 million. The market value of agricultural products sold in Jackson County for 2017 was approximately $314.51 million, with crop revenue at approximately $182.90 million and livestock revenue at approximately $131.61 million.

The Natural Resources Conservation Service (NRCS) classifies approximately 35.4 percent of the land in the Project Area as prime farmland, and 56.1 percent as prime farmland, if drained, and 4.3 percent is farmland of statewide importance. Only 2.9 percent of land within the Project Area is not prime farmland.

The use of feedlots is a common practice in raising livestock in the state of Minnesota. According to MPCA's "What's In My Neighborhood" database, there are 788 registered active feedlots in Martin County, and 573 registered active feedlots in Jackson County. There are 40 feedlots located within the Project Area. Out of the 40 feedlots, 28 are classified as 'feedlot' and 2 are classified as 'multiple activities' with feedlots in the list.

There are no economically important forestry or mining resources within the Project Area.

8.11.1 Impacts and Mitigative Measures

Construction of the Project would cause minimal, temporary impacts to farmland. Temporary impacts to farmland could potentially consist of access road approaches, crane paths, turning radii, equipment laydown/construction areas, and/or intersection improvements. When construction occurs outside of winter months, there is a higher possibility for temporary minor impacts including soil compaction, loss of planting opportunity, crop damage, and drain tile damage. Construction activities may temporarily disrupt livestock in pastureland due to equipment operation. Elm Creek II will take appropriate measures to confirm fenced pastureland is secure, including installation of temporary fencing as necessary. Elm Creek II will repair any fences damaged by construction activities.

Elm Creek II will coordinate with landowners to identify property features, such as drain tiles, prior to construction activities. Elm Creek II will avoid these features where practicable and repair any damaged drain tile upon completion of construction activities. To the extent possible, Elm Creek II will locate construction work areas where previous soil impacts have occurred to avoid impacting undisturbed farmland. Elm Creek II will alleviate any incidental soil compaction that may occur because of temporary construction activities, including turbine pad construction areas, collector line easements, the laydown area, and crane paths, by decompacting and revegetating when construction is complete. As demonstrated by other wind energy projects in the Midwest, agricultural practices continue during construction and operations.

The Project does not expect to construct any new aboveground facilities or turbines within the Project Area except for the proposed ADLS system and capacitor bank. Elm Creek II continues to coordinate with vendors to confirm equipment location and land use needs, but expects impacts from any new equipment to be less than an acre in size. Lands adjacent to the Facility can remain in agricultural production and/or cattle grazing. Landowners may continue to plant crops near, and graze livestock up to, the gravel roadway around each turbine pad.

Project construction and operations will not occur within forestry and mining resources; therefore, direct impacts to those resources will not occur. The proposed mitigative measures described above will effectively avoid and minimize impacts such that the Project will not result in unavoidable adverse impacts to land-based economies.

8.12 Tourism

Jackson and Martin Counties offer tourism and recreational opportunities throughout the year. Minnesota's 2020 Tourism Facts showed that Martin County had $36.39 million in gross annual sales and employed 707 people in private sector tourism. Jackson County had $9 million in gross annual sales and employed 226 people in private sector tourism (reference (33)). Generally, tourism in Jackson and Martin counties focuses on promoting the area's cultural and outdoor recreational activities.

8.12.1 Impacts and Mitigative Measures

The Project Area is located on private lands; therefore, negligible impacts to existing recreational facilities and tourism activities will occur. Increased construction traffic levels on adjacent public roads could have indirect temporary impacts on tourism. Conformance to the setbacks from recreational facilities, public roads, and non-leased properties minimizes any indirect impacts.

The Project will not cause adverse impacts to tourism.

8.13 Local Economies and Community Benefits

The Project Area is predominantly rural with an agriculture-based economy. Corn and wheat crop production, livestock operations, and associated industries drive the local economy. Manufacturing and service industries (restaurants, hotels, repair shops, and convenience and retail stores) are concentrated in the urban areas located east and southwest of the Project Area (Jackson, Sherburn, Alpha, and Trimont).

8.13.1 Tax Payments

The counties may experience short-term positive economic impacts associated with tax payments during the construction phase of the Project through the use of hotels, restaurants, and other consumer goods and services by the various workers, as well as the purchase of materials such as fuel, concrete, and gravel from local vendors. Elm Creek II anticipates that the economic impact will benefit nearby towns.

The Project will continue to provide long-term positive economic benefits to local landowners, the state, and the local economy of southwestern Minnesota. Landowners in the Project Area will continue to benefit from annual lease payments. In accordance with state and county law, the Project will continue to pay property tax and production taxes on the land and energy production to local governments. For example, Elm Creek II pays a Wind Energy Production Tax to the local units of government of $1.20 per megawatt hour of electricity produced. This results in an annual Wind Energy Production Tax of up to approximately $600,000 dollars for the local community governments once the Project repowering is complete.

8.13.2 Impacts and Mitigative Measures

Overall, the Project will positively impact the local economy by adding temporary jobs, maintaining current permanent positions, increasing the county's tax base, and providing lease payments to Project participants. The communities near the Project are also expected to receive positive economic benefits as

construction will necessitate the need for numerous temporary workers and will provide an ongoing need for maintenance workers to continue to operate the Facility.

The Project plans to use local contractors and suppliers, where feasible, for portions of construction, thereby contributing to the overall economy of the region. Wages and salaries paid to contractors and workers in Martin and Jackson Counties will contribute to the overall personal income of the region. Purchase of products to construct and operate the facilities, such as fuel, equipment, services, and supplies, will benefit businesses in the counties as well as in the state.

Minor short-term impacts to the socioeconomic resources of the area may occur. The Project may temporarily remove small areas from agricultural production during construction. No additional land is anticipated to be removed from agricultural production during Project operations.

8.14 Topography

The Project Area is located inside the Minnesota River Prairie subsection of the North Central Glaciated Plains section of the Prairie Parkland Province. The Minnesota River Prairie subsection consists of gently rolling ground moraine. Loamy ground moraine (till plain) is the dominant landform, but end moraines and lake plains also occupy a significant area. Ground moraine topography is level to gently rolling and is underlain by thick glacial drift ranging from 250 to more than 500 feet deep. In the Project Area, elevations range between 1,245 to 1,431 feet above sea level. Topography is fairly level, sloping from highest in the southwest portion of the Project Area to the depression formed by Elm Creek in the northeastern portion of the Project (Map 10).

8.14.1 Impacts and Mitigative Measures

Project workspace will be temporary in nature and no areas of significant elevation change in the Project Area are planned. As such, no impacts to topography are anticipated and no mitigative measures are proposed.

8.15 Soils

Soil information within the Project Area was obtained from the USDA-NRCS Soil Survey Geographic Database (SSURGO) (reference (34)). Soil types that make up three percent or greater of the Project Area are summarized in Table 8-19. The dominant soil types within the Project Area include: (87 percent) Canisteo-Glencoe complex, Clarion load, Nicollet clay loam, Crippin loam, Webster clay loam, Nicollet-Crippin, and Glencoe clay loam Area (Map 11). The remaining 13 percent are made up of 30 separate soil types that each make up less than three percent of the Project Area.

Table 8-19 Soil Types within the Project Area

Soil Map Unit Name (Map Unit Symbol)	Unified Soil Classification (Surface)[1]	Erosion Hazard	Drainage Class	Hydrologic Soil Group[2]	Ac in Project Area	% of Project Area
Canisteo-Glencoe complex, 0 to 2% slopes (L107A)	MH	Slight	Poorly drained	C/D	12,787.5	42.0
Clarion loam, 2 to 6% slopes (102B)	ML	Moderate	Moderately well drained	C	3,513.5	11.5
Nicollet clay loam, 1 to 3% slopes (L85A)	MH	Slight	Somewhat poorly drained	C/D	2,828.1	9.3
Crippin loam, 1 to 3% slopes (118)	ML	Slight	Somewhat poorly drained	B/D	1,942.5	6.4
Webster clay loam, 0 to 2% slopes (113)	MH	Slight	Poorly drained	C/D	1,276.9	4.2
Webster clay loam, 0 to 2% slopes (L83A)	MH	Slight	Poorly drained	C/D	1,124.4	3.7
Nicollet-Crippin complex (886)	CL	Slight	Somewhat poorly drained	B/D	1,068.7	3.5
Glencoe clay loam, 0 to 1% slopes (L84A)	MH	Slight	Very poorly drained	C/D	975.0	3.2

[1] ML = inorganic silts and very fine sands, rock flour, silty of clayey fine sands, or clayey silts with slight plasticity. CL = Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. MH = Inorganic silts and very fine sands, rock flour, silty of clayey fine sands, or clayey silts with slight plasticity.

[2] B = moderately low runoff potential; C = moderately high runoff potential; D = high runoff potential

The USDA-NRCS SSURGO also identifies farmland soils based on three categories, which are all subject to protection under the Farmland Protection Policy Act. These categories include prime farmland, prime farmland when drained, and farmland of statewide importance. Prime farmland is defined by the NRCS 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. Prime farmland when drained includes soils that have the potential to be prime farmland but require drainage or hydrologic alteration to achieve high productivity. Farmland of statewide importance includes soils that are nearly prime, but are not as productive due to permeability, slope, erosion potential, or some other soil property. Approximately 35 percent (10,778.4 ac) of the Project Area is mapped as prime farmland, 56 percent (17,057.3 ac) is mapped as prime farmland if drained, and four percent (1,306.8 ac) is mapped as farmland of statewide importance.

8.15.1 Impacts and Mitigative Measures

The Project will result in minor short-term impacts to soils during construction and less than an acre of permanent conversion of land for the ADLS system and capacitor bank, if needed. Areas of prime farmland soils may be temporarily impacted and those impacts are anticipated to be minor from the Project. Equipment traffic may compact the soil, potentially reducing the porosity in the soil and

percolation rates, which could lead to increased runoff and potentially reduced crop yields. Landowners will be compensated for crops damaged by temporary construction impacts.

During construction, contractors will use BMPs in accordance with the Elm Creek II SWPPP to avoid and minimize impacts to soil resources to the extent practicable. Those BMPs may include the following:

- Topsoil/subsoil segregation: The construction contractor will strip and segregate the topsoil separately from the subsoil where excavation work will occur.
- Mulch: contractor will use mulch to stabilize exposed soils.
- Perimeter sediment controls (silt fence, sediment control logs, and filter berms): Prior to land disturbing activities, the contractor will install sediment controls where necessary on downgradient perimeters and upgradient of any buffer zones, a protective zone surrounding impacted areas to protect the non-impacted environment.
- Vehicle tracking BMPs (rock pads, mud mats, slash mulch, concrete or steel wash racks, or an equivalent system): the contractor will use vehicle tracking BMPs where vehicles leave the Project Area.
- Revegetation: The majority of soil-disturbing activities will occur in agricultural areas. In agricultural areas, including areas of prime farmland, final stabilization will occur by returning temporarily disturbed land to its pre-construction agricultural use. Non-agricultural areas will be reseeded and mulched. Elm Creek II will work with landowners and the local NRCS office to identify the appropriate seed mixes for non-agricultural areas. Decompaction of soils will occur in construction areas including turbine erection areas, shoulders of access roads, crane paths and reclaimed laydown yards.

8.16 Geologic and Groundwater Resources

8.16.1 Geology

The surficial geology in the vicinity of the Project is ground and stagnation moraine deposited by the Altamont moraine association of the Des Moines Lobe approximately 14,000 years ago. The surficial deposits are glacial till that is very poorly sorted sediments deposited by glacial ice. The Des Moines Lobe till is calcareous, shale-rich, and composed of unsorted clay, silt, sand, gravel, and cobbles. Lenses of sand and gravel are found intermixed in the clay throughout the unit. The glacial material is approximately 200 to 300 feet thick in the Project Area and topography is relatively flat (Map 12).

The uppermost bedrock unit in the Project Area is Precambrian quartzite and granitic crystalline rocks. Cambrian, Ordovician, and Cretaceous sedimentary bedrock deposits are east of the Project Area but were not deposited in or eroded from the Project Area prior to deposition of glacial sediments. Localized areas of bedrock highs can be found in the Project Area (Map 13).

8.16.1.1 Impacts and Mitigative Measures

The Project will not cause changes to existing geologic resources; therefore, Elm Creek II does not propose mitigative measures.

8.16.2 Groundwater

Geologic-related mineral resources in the Project Area include groundwater and minor sand and gravel deposits. Groundwater resources in the vicinity of the Project Area are generally derived from buried sand and gravel lenses. The nearby Trimont municipal water supply obtains water from a buried glacial outwash aquifer at a depth of 125 feet. Domestic water supplies may be obtained from similar, but mainly discontinuous buried glacial sand and gravel aquifers. Domestic water supplies tend to use local Rural Water Service.

8.16.2.1 Impacts and Mitigative Measures

No impacts to groundwater resources are anticipated because the Project will not change existing Facility water supply needs; therefore, Elm Creek II does not propose mitigative measures.

8.17 Surface Water and Floodplain Resources

The Project Area is located within portions of the Blue Earth River (HUC 8 07020009) and East Fork Des Moines River (HUC 8 107100003) watersheds. The main watercourses in the Project Area include Elm Creek, Judicial Ditch 32, and East Fork Des Moines River. In addition, unnamed streams, ditches, and small lakes are scattered within the Project Area (Map 14).

According to the DNR Public Waters Inventory (PWI) dataset, there are six watercourses, two ditches, and one basin classified as PWI waters within the Project Area (Table 8-20). PWI waters are regulated by the DNR and watercourses and basins generally have a 50 foot (15 m) buffer requirement, while ditches have a 16.5 foot (5.0 m) designated buffer requirement (reference (35)).

Table 8-20 Public Water Inventory Waters within the Project Area

PWI Type	PWI Feature Name	PWI Unique Feature ID	Length/Area Within Project Area
Watercourse	Des Moines River, East Fork	I-034	25,705 ft
Watercourse	Elm Creek	M-055-076-012	29,009 ft
Watercourse	Elm Creek, South Fork	M-055-076-012-030	35,298 ft
Watercourse	Judicial Ditch 32	I-034-014	3,074 ft
Watercourse	Unnamed stream	M-055-076-012-029-003	2,560 ft
Watercourse	Unnamed stream	M-055-076-012-029-001	9,468 ft
Watercourse	Unnamed stream	M-055-076-012-029	14,459 ft
Ditch	County Ditch 1	I-034-006-003	4,112 ft
Ditch	Unnamed stream	I-034-014-003	7,865 ft
Ditch	Unnamed stream	I-034-006-003-003	90 ft
Ditch	Judicial Ditch 32	I-034-014	16,101 ft
Basin	Hassings Slough	32000300	33.9 ac
Basin	Watkins Lake	46013200	45.5 ac

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 every two years. Table 8-21 summarizes waters designated as impaired within the Project Area.

Table 8-21 Impaired Waters within the Project Area

Water Course Name/ID	Description	Affected Designated Use	Pollutant/Stressor	Length of Waterway Designated as Impaired within Project Area
Elm Creek 07020009-522	South Fork Elm Creek to Cedar Creek	Aquatic Life/Aquatic Recreation	Benthic macroinvertebrates bioassessments, fish bioassessments, turbidity, fecal coliform	24,182.5 ft
South Fork Elm Creek 07020009-524	T103 R34W S30, west line to T103 R34W S1, north line	Aquatic Life	Turbidity	27,808.1 ft
South Fork Elm Creek 07020009-561	T104 R34W S36, south line to Elm Creek	Aquatic Life	Benthic macroinvertebrates bioassessments, fish bioassessments	7,502.6 ft
Elm Creek 07020009-631	570th Ave to South Fork Elm Creek	Aquatic Life	Fish bioassessments, turbidity	4,827.7

Source: reference (36)

There are no state-designated trout streams within the Project Area. None of the waterbodies within the Project Area are identified as prohibited outstanding resource value waters under Minn. R. 7050.0335, Subp. 3. There are no designated lakes for wildlife management under the authority of Minn. Stat. § 97A.101, Subd. 2 or migratory waterfowl feeding and resting lakes within the Project Area.

Federal Emergency Management Agency Flood Insurance Rate Maps have been created for the Project Area (Map 15). A portion of the Des Moines River, East Fork, in the southeast corner of the Project Area is classified as a FEMA 100-year floodplain. All portions of the Elm Creek River within the Project Area are designated as FEMA 100-year floodplain (Map 15).

8.17.1 Impacts and Mitigative Measures

Elm Creek II has designed the Project and associated temporary workspaces to avoid or minimize adverse impacts to surface water resources and floodplains. However, due to the presence of watercourses within the Project Area, permits may be required for temporary impacts during construction. Potential temporary impacts will be coordinated with the DNR, U.S. Army Corps of Engineers (USACE), and the Local Government Units administering the Minnesota Wetland Conservation Act (WCA), as appropriate.

Temporary dewatering may be necessary during construction collector line replacements and turbine foundation reinforcements. If needed, dewatering will occur in a manner such that the velocity of the discharged water will not cause scouring of the receiving area.

There is potential for erosion and sedimentation to occur associated with ground-disturbing activities. Elm Creek II will develop a SWPPP and obtain construction stormwater permit coverage prior to construction, and will implement BMPs, such as silt fencing. Because there are impaired waters within the Project Area, the National Pollutant Discharge Elimination System (NPDES) permit and SWPPP will require additional BMPs for potential runoff to these waters. As part of the NPDES permit process, Elm Creek II will design BMPs for the entire Project, including near impaired waters. The MPCA will review the SWPPP prior to finalizing.

There will be no permanent impacts to surface waters or floodplains; therefore, mitigative measures are not proposed beyond implementation of BMPs described above.

8.18 Wetlands

According to the USFWS National Wetlands Inventory (NWI), the Project Area contains approximately 732 ac of wetland, which represents about two percent of the Project Area (Map 16). NWI-mapped wetlands consist of freshwater emergent, pond, shrub, and forested wetland communities. In addition, the NWI maps several riverine wetland communities associated with Elm Creek and East Fork Des Moines River.

A wetland delineation was conducted in June of 2023 to assess the presence of wetlands within an approximated, 818-acre area representing an approximated construction footprint. During the wetland delineation, approximately 17.5 ac of wetland were identified within the approximated construction footprint (Map 17). A second mobilization will occur in the Spring of 2025 to delineate the remainder of the construction footprint including preliminary crane paths and laydown yards. Table 8-22 includes a summary of the delineated wetlands to date. The majority of delineated wetlands are seasonally flooded basins (15.3 ac), 90 percent of which are currently being farmed. Additional wetland types mapped within the approximated construction footprint include wet meadow and shrub swamp communities.

Table 8-22 Delineated Wetland Summary

Wetland ID	Circular 39 Type	Cowardin Type	Wetland Area (ac)
WB01	Type 1 - Seasonally Flooded Basin	PEM1Af	1.63
WB02	Type 1 - Seasonally Flooded Basin	PEM1Af	1.17
WB03	Type 2 - Fresh (Wet) Meadow	PEM1A	0.01
WB04	Type 1 - Seasonally Flooded Basin	PEM1Af	0.01
WB05	Type 1 - Seasonally Flooded Basin	PEM1Af	0.61
WB06	Type 1 - Seasonally Flooded Basin	PEM1Af	0.49
WB07	Type 1 - Seasonally Flooded Basin	PEM1Af	0.20
WB08	Type 1 - Seasonally Flooded Basin	PEM1Af	0.08
WB09	Type 1 - Seasonally Flooded Basin	PEM1Af	0.30
WB10	Type 1 - Seasonally Flooded Basin	PEM1Af	0.07

Wetland ID	Circular 39 Type	Cowardin Type	Wetland Area (ac)
WB11	Type 1 - Seasonally Flooded Basin	PEM1A	0.83
WB12	Type 2 - Fresh (Wet) Meadow	PEM1A	0.90
WB13	Type 1 - Seasonally Flooded Basin	PEM1Af	0.97
WB14	Type 1 - Seasonally Flooded Basin	PEM1Af	0.71
WB15	Type 1 - Seasonally Flooded Basin	PEM1Af	0.22
WB16	Type 1 - Seasonally Flooded Basin	PEM1Af	2.71
WB17	Type 1 - Seasonally Flooded Basin	PEM1Af	0.07
WB18a	Type 2 - Fresh (Wet) Meadow	PEM1A	1.00
WB18b	Type 1 - Seasonally Flooded Basin	PEM1A	0.34
WB19	Type 2/6 - Fresh (Wet) Meadow/Shrub Carr	PEM1A	0.21
WB20	Type 2 - Fresh (Wet) Meadow	PEM1A	0.03
WB21	Type 2 - Fresh (Wet) Meadow	PEM1A	0.03
WB22	Type 1 - Seasonally Flooded Basin	PEM1Af	0.03
WB23	Type 1 - Seasonally Flooded Basin	PEM1Af	0.26
WB24	Type 1 - Seasonally Flooded Basin	PEM1Af	0.36
WB25	Type 1 - Seasonally Flooded Basin	PEM1Af	0.11
WB26	Type 1 - Seasonally Flooded Basin	PEM1Af	0.15
WB27	Type 1 - Seasonally Flooded Basin	PEM1Af	0.10
WB28	Type 1 - Seasonally Flooded Basin	PEM1Af	0.20
WB29	Type 1 - Seasonally Flooded Basin	PEM1Af	0.27
WB30	Type 1 - Seasonally Flooded Basin	PEM1Af	0.10
WB31	Type 1 - Seasonally Flooded Basin	PEM1Af	0.65
WB32	Type 1 - Seasonally Flooded Basin	PEM1Af	0.13
WB33	Type 1 - Seasonally Flooded Basin	PEM1Af	0.05
WB34	Type 1 - Seasonally Flooded Basin	PEM1Af	0.06
WB35a	Type 1 - Seasonally Flooded Basin	PEM1Af	0.17
WB35b	Type 1 - Seasonally Flooded Basin	PEM1Af	0.14
WB36	Type 1 - Seasonally Flooded Basin	PEM1Af	0.44
WB37	Type 1 - Seasonally Flooded Basin	PEM1Af	0.30
WB38	Type 1 - Seasonally Flooded Basin	PEM1Af	0.02
WB39a	Type 1 - Seasonally Flooded Basin	PEM1Af	0.13

Wetland ID	Circular 39 Type	Cowardin Type	Wetland Area (ac)
WB39b	Type 1 - Seasonally Flooded Basin	PEM1Af	0.11
WB40a	Type 1 - Seasonally Flooded Basin	PEM1Af	0.07
WB40b	Type 1 - Seasonally Flooded Basin	PEM1Af	0.09
WB41	Type 1 - Seasonally Flooded Basin	PEM1Af	0.12
WB42	Type 1 - Seasonally Flooded Basin	PEM1Af	0.16
WB43	Type 1 - Seasonally Flooded Basin	PEM1Af	0.27
WB44	Type 1 - Seasonally Flooded Basin	PEM1Af	0.05
WB45	Type 1 - Seasonally Flooded Basin	PEM1A	0.18
WB46	Type 1 - Seasonally Flooded Basin	PEM1A	0.14
WB47	Type 1 - Seasonally Flooded Basin	PEM1Af	0.04
WB48	Type 2 - Fresh (Wet) Meadow	PEM1A	0.05
		Total Acres	**17.5**

8.18.1 Impacts and Mitigative Measures

The Project does not require new permanent aboveground infrastructure except for the ADLS system and capacitor bank, which will be sited to avoid sensitive environmental resources, including wetlands. As such, permanent wetland impacts are not anticipated. Temporary ground disturbance will generally be limited to the laydown yard, temporary turning radius improvements, collector line easements, crane assembly areas, staging at turbine sites, and installation of the turbine foundation reinforcement collars, as needed (Section 10). These temporary ground disturbances will occur primarily in uplands and will avoid wetlands to the extent feasible. Temporary wetland impacts may occur during Project construction associated with crane paths and upgrades to collector lines.

Elm Creek II will implement BMPs to protect topsoil, minimize soil erosion, and protect wetland resources from direct and indirect impacts. Depending on site-specific needs, Elm Creek II may use temporary timber matting, erosion control blankets, mulch, straw bales, rolls, temporary seeding, hydromulch, and sediment fencing to manage soil erosion.

Jurisdictional wetlands within the approximated construction footprint are regulated under Sections 404 and 401 of the CWA, administered by the USACE and MPCA, respectively. The WCA of 1991, as amended, administered in this area by the Martin County Soil and Water Conservation District (SWCD) and the Jackson County SWCD, also regulates impacts to wetlands. Coordination with the USACE and the Martin and Jackson County SWCDs will occur, if necessary, prior to construction upon final confirmation of temporary wetland disturbance types.

8.19 Vegetation

The DNR, in collaboration with the U.S. Forest Service, developed an Ecological Classification System (ECS) for hierarchical mapping and classification of Minnesota land areas with similar native plant communities and other ecological features. Based on the ECS, the Project Area is in the Minnesota River Prairie Subsection of the North Central Glaciated Plains Section of the Prairie Parkland Province (reference (37)). Pre-settlement vegetation in the subsection primarily consisted of tallgrass prairie, with islands of wet prairie. Forests were primarily associated with floodplains along the Minnesota River and other watercourses. At present, agricultural vegetation dominates the subsection, with corn and wheat representing the dominant crops. Wetlands are also present in the subsection; these are discussed in Section 8.18.

The 2016 National Landcover Database – Land Use-Land Cover dataset indicates that the Project Area primarily contains cultivated cropland making up approximately 91.6 percent of the Project Area (Map 6). Remaining land cover is summarized in Table 8-23. Natural vegetation within the Project Area is largely confined to the herbaceous or mixed forest areas. These locations are typically used as buffer strips.

Table 8-23 Land Cover within the Project Area

Land Cover	Acres in Project Area	Percent of Project Area
Cultivated Crops	27,868.86	91.58
Developed, Open Space	922.78	3.02
Emergent Herbaceous Wetlands	387.22	1.27
Developed, Low Intensity	305.48	1.00
Mixed Forest	231.75	0.76
Herbaceous	217.70	0.72
Hay/Pasture	201.14	0.66
Developed, Medium Intensity	148.34	0.49
Open Water	47.09	0.15
Deciduous Forest	44.94	0.15
Developed, High Intensity	33.75	0.11
Barren Land	10.90	0.04
Woody Wetlands	9.95	0.03
Shrub/Scrub	1.78	0.01
Total	30,431.67	100

8.19.1 Impacts and Mitigative Measures

Temporary construction workspaces for the Project were designed to avoid wetlands and other areas of natural vegetation, such as native plant communities (see Sections 8.18 and 8.21.2, respectively). Temporary vegetation impacts associated with construction will primarily occur in cultivated cropland. Impacts to agriculture are discussed in Section 8.11.

Impacts to vegetation will be minimized by using existing access roads and turbine locations to the greatest extent practical, thus reducing the amount of new ground disturbances.

Ground disturbance associated with temporary construction impacts have the potential to lead to the introduction and/or spread of noxious weeds. Elm Creek II will minimize the potential introduction/spread of noxious weeds through implementation of BMPs such as:

- Early detection of noxious weeds;
- Cleaning vehicles, mowers, and bladed equipment;
- Minimizing disturbance to native areas;
- Limiting traffic through weed-infested areas, if possible; and
- Frequently inspecting equipment storage areas for weeds.

Restoration of disturbed soils and vegetation will occur as soon as possible after construction activities are completed. Elm Creek II will restore areas of disturbed soil in non-cropped areas using weed-free native grasses, forbs, and shrubs. In cropped areas, a temporary cover crop may be planted to stabilize soils depending on the timing of construction completion and the next growing season.

8.20 Wildlife

Wildlife in the Project Area primarily consists of migratory and resident birds, mammals, fish, reptiles, amphibians, and insects associated with tilled agricultural landscapes. Wildlife species associated with pasture grasslands, riparian areas, and wetland and forested areas are also present. Wildlife use habitat within the Project Area for foraging, breeding and/or shelter. The vegetation in the Project Area is primarily agricultural row crops with adjacent roadside ditches. Trees, including farmsteads and shelterbelts, and some emergent wetland areas are also present. Following is a discussion of migratory and resident birds, mammals, reptiles, amphibians, and insects that are expected to exist in the Project Area.

8.20.1 Birds

Various migratory and resident bird species use the Project Area as a part of their life cycle. Migratory bird species are those that may use the Project Area for resting, foraging, or breeding activities for only a portion of the year. Resident bird species occupy the Project Area site throughout the year. Common songbirds in the region include western meadowlark (*Sturnella neglecta*), song sparrow (*Melospiza melodia*), American robin (*Turdus migratorius*), and red-winged blackbird (*Agelaius phoeniceus*;

reference (38)). Common shorebird species in the region include killdeer (*Charadrius vociferus*) and upland sandpiper (*Bartramia longicauda*); however, other migratory shorebirds could pass through in the spring and summer. Upland gamebirds in the region include ring-necked pheasant (*Phasianus colchicus*) and gray partridge (*Perdix perdix*). Common raptors in the region include bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), northern harrier (*Circus hudsonius*), and Swainson's hawk (*B. swainsoni*). Common waterfowl in the region include mallards (*Anas platyrhynchos*), blue-winged teal (*Spatula discors*), and wood ducks (*Aix sponsa*). Avian species of concern with potential to occur within the Project Area are discussed in Section 8.21.1.

Although the majority of the habitat within the Project Area consists of agricultural row crops, scattered wetlands, grasslands, and forested areas provide potential suitable habitat for avian species. Section 8.8.1 describes WMAs in or near the Project Area.

Eagles

Due to population declines in the 1960s, bald eagles were listed as threatened in Minnesota when the state created its endangered species list in 1984 (reference (39)). In coordination with the USFWS, the DNR conducted eagle surveys in 2000 and 2005 (reference (39)), prior to the federal delisting of the bald eagle in 2007. These surveys indicated a 28 percent increase in nesting bald eagles between survey years (reference (39)). This successful comeback resulted in the decision to end the DNR's statewide eagle nest surveys in Minnesota and contributed to the state and federal delisting of the species in 2007 (reference (40)); however, bald eagles are still protected under both the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act (BGEPA).

In Minnesota, bald eagles generally nest in large trees near lakes and rivers, historically in remote areas (reference (40)). Bald eagles have expanded their nesting range from northern Minnesota and currently nest throughout much of Minnesota, including in the southern portion of the state (reference (41)). Although no formal eagle nest survey was conducted for the original Elm Creek II, Western EcoSystems Technology, Inc. (WEST) conducted a site visit in 2009 to assist with screening and characterization of the site. No raptor nests were observed during the site visit in 2009. In April 2023, a ground-based bald eagle nest survey was conducted for the Project (reference (42)). All public roads within the leased lands within the Project Area and a 2.0-mi buffer were driven by a qualified biologist scanning trees for nest structures (reference (42)). Two occupied and active bald eagle nests were documented outside of the Project Area, but within the 2.0-mi buffer of the leased lands at the Project. Both nests were located more than 1.5 mi from the existing turbine locations.

Jackson County eBird records indicate that relative abundance (the average number of birds reported on all eBird checklists within a specified date range and region) of bald eagles is greatest in December, followed by November, February, and March (reference (38)). Data from eBird in Martin County similarly shows the highest bald eagle relative abundance in December, followed by February, and then October (reference (38)). In the winter, when many lakes are iced-over, bald eagles rely on carrion and waterfowl concentrations as food sources (reference (43)). Bald eagles may use the lakes in the region for foraging opportunities and may pass through the Project Area throughout the year, traveling between nearby lakes.

Golden eagles (*Aquila chrysaetos*) are also protected under the Migratory Bird Treaty Act and the BGEPA. They are largely found in the western United States but can be found in Minnesota during migratory periods. A wintering population exists in southeastern Minnesota and western Wisconsin, about 162 mi (261 km) east of the Project Area. No eBird records of golden eagles have been reported in the last 10 years in Jackson County or Martin County (reference (38)). Because golden eagles are not known to breed in Minnesota, occurrence is likely limited to infrequent observations in winter, spring, or fall.

Other Avian Data

According to the USFWS Information for Planning and Consultation (IPaC) online tool (Appendix K), 11 Birds of Conservation Concern (BCC) have potential to occur in the Project Area at different times of the year, including breeding and migration periods. It is important to note that because the IPaC lists a BCC species as potentially present during the breeding period, that does not indicate that there are records of the bird breeding in the Project Area. BCC species are those that have been identified as likely to become candidates for listing under the Endangered Species Act (ESA) if no additional conservation actions are taken (reference (44)). A discussion of federally listed (under the ESA) and state-listed species, including avian species, can be found in Section 8.21.1.

BCC that have potential to occur in the Project Area and are not also state or federally listed (Section 8.21.1) consist of:

- Black tern (*Chlidonias niger*; potential to occur within the Project Area during the breeding and migration periods)
- Bobolink (*Dolichonyx oryzivorus*; breeding and migration)
- Lesser yellowlegs (*Tringa flavipes*; migration)
- Red-headed woodpecker (*Melanerpes erythrocephalus*; breeding and migration)
- Willet (*T. semipalmata*; breeding and migration)

Department of Natural Resources Waterfowl Feeding and Resting Areas

DNR Migratory Waterfowl Feeding and Resting Areas (MWFRA) are waterbodies that are protected for resting and migrating waterfowl by prohibiting motors on the water during certain times of the year (reference (45)). No MWFRA occur within the Project Area. Heron Lake and South Heron Lake are the nearest MWFRAs to the Project Area, located approximately 12.4 mi to the west.

Important Bird Areas

The National Audubon Society (Audubon) has identified Important Bird Areas (IBA) that provide essential bird habitat (reference (46)). The nearest IBA is the state-level Des Moines River IBA, located approximately 2.0 mi west of the Project Area. This IBA covers 38,225 ac and includes 38.0 mi of the Des Moines River (reference (47)). The Des Moines River IBA is considered to have ornithological significance as it provides a corridor of grassland, wetland, and forest habitat through a highly cultivated area (reference (47)).

8.20.2 Mammals

The mammal population in the area includes white-tailed deer (*Odocoileus virginianus*), rabbit (*Lepus* spp.), red fox (*Vulpes vulpes*), badger (*Taxidea taxus*), skunk (*Mephitidae* spp.), squirrel (*Sciuridae* spp.), and other related rodents (*Rodentia* spp.). These species use the food and cover available from agricultural fields, grasslands, farm woodlots, wetland areas, and wooded areas. Grassland areas and woody vegetation are also habitat for a variety of small mammals, including:

- House mice (*Mus musculus*)
- Deer mice (*Peromyscus maniculatus*)
- Least weasels (*Mustela nivalis*)
- Long-tailed weasels (*M. frenata*)
- Prairie voles (*Microtus ochrogaster*)
- Meadow voles (*M. pennsylvanicus*)

Several bat species have the potential to occur within the Project Area as well. Mammal species of concern with potential to occur within the Project Area are discussed in Section 8.21.1.

Bats

The Project Area is within the range of several bat species, including:

- Northern long-eared bat (*Myotis septentrionalis*; state special concern species [SPC], federally-listed as endangered)
- Tri-colored bat (*Perimyotis subflavus*; state SPC and proposed to be federally-listed as endangered)
- Little brown bat (*M. lucifugus*; state SPC and under review for federal listing)
- Big brown bat (*Eptesicus fuscus*; state SPC)
- Silver-haired bat (*Lasionycteris noctivagans*)
- Eastern red bat (*Lasiurus borealis*), and hoary bat (*L. cinereus*)

On March 31, 2023, the USFWS published a final rule to reclassify the northern long-eared bat as endangered (reference (48)). On September 14, 2022, the USFWS published a proposed rule to list the tri-colored bat as endangered (reference (49)). A final ruling on the status of the tri-colored bat is anticipated in 2025.

Although the ranges of these bats overlap the Project Area, the preferred habitats of these species are not particularly abundant within the Project Area. For instance, little brown and big brown bats use lakes and streams for foraging and caves, streams, and artificial structures for roosting. Although artificial structures and small streams are present within the Project Area, these habitats are dispersed and not of the quality

that would be expected to attract large numbers of bats. Silver-haired, eastern red, and hoary bats are forest-dwelling species, and forested areas are relatively limited and fragmented within the Project Area.

Given that the Project Area is within the summer range of northern long-eared bat, tri-colored bat, and little brown bat, a summer habitat assessment was conducted for the Project (Appendix L). The habitat assessment focused on summer habitat for northern long-eared bat and tri-colored bat, but non-listed bat species could also use this habitat.

Bat Habitat Assessment

In 2023, WEST assessed forested habitat potentially suitable for northern long-eared bats and tri-colored bats within a buffer of existing turbines at the Project (Appendix L) in accordance with Phase I of the USFWS 2023 *Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines* (reference (50)). The 2023 Guidelines were approved for temporary use for the tri-colored bat until formal guidance is released for this species. The 2024 Guidelines have been released since the bat habitat assessment was conducted (reference (50)). Although the 2024 Guidelines provided some updated guidance regarding survey approach specific to northern long-eared bats and tri-colored bats, the 2024 approach to mapping potential habitat did not change compared to what was completed for the 2023 bat habitat assessment. WEST assessed habitat within a buffer of all turbines equal to 1,000 feet plus the proposed turbine blade length (59 m). Approximately 30 ac of potentially suitable habitat were identified, primarily limited to relatively small, isolated patches.

Section 8.21.1 provides additional discussion on northern long-eared bats, tricolored bats, and little brown bats.

8.20.3 Reptiles and Amphibians

Reptile and amphibian species, which may be present in the Project vicinity include (reference (51)):

- Western plains garter snake (*Thamnophis radix*)
- Common garter snake (*T. sirtalis*)
- Redbelly snake (*Storeria occipitomaculata*)
- Snapping turtle (*Chelydra serpentina*)
- Western painted turtle (*Chrysemys picta bellii*)
- American toad (*Anaxyrus americanus*)
- American bullfrog (*Lithobates catesbeianus*)
- Northern leopard frog (*L. pipiens*)
- Western chorus frog (*Pseudacris triseriata*)
- Eastern tiger salamander (*Ambystoma tigrinum)*

Species of concern with potential to occur within the Project Area are discussed in Section 8.21.1.

8.20.4 Insects

Although insect species are important to the indigenous vegetation and wildlife, honeybees (*Apis mellifera*) are the only species economically important in the Project Area. There are two licensed apiaries located within 1.0 mi of the Project Area in Jackson County (reference (52)). Species of concern with potential to occur within the Project Area are discussed in Section 8.21.1.

8.20.5 Impacts and Mitigative Measures

Birds

One year of bird and bat post-construction fatality monitoring studies occurred at an adjacent wind project (reference (53)) and the original Elm Creek II turbines (reference (54)). Additionally, one year of post-construction fatality monitoring recently occurred at the nearby Trimont Wind project (Trimont), after that project was repowered (turbines stayed in the same locations as the original turbines (reference (55)). The results of all three studies are summarized below as potentially relevant indicators of the level of avian fatalities expected after Project construction is complete.

At Elm Creek I, a total of three birds (one killdeer, one ring-necked pheasant, and one yellow-throated vireo [Vireo flavifrons]) were found during standardized carcass surveys conducted from 2009-2010. One additional injured bird was found incidentally outside of a search plot (red-tailed hawk). The overall bird fatality rate was estimated at 1.55 birds/MW/year, which falls at the low end of the range of other fatality estimates at wind farms in Minnesota and the Midwest (reference (53)). No federal or state-threatened or endangered bird species were found as fatalities at the Elm Creek I project during post-construction fatality monitoring (reference (53)).

At Elm Creek II, a total of ten birds were found during standardized carcass surveys conducted from 2011-2012:

- One cliff swallow (*Petrochelidon pyrrhonota*)
- One horned lark (*Eremophila alpestris*)
- One song sparrow
- One sora (*Porzana carolina*)
- One Tennessee warbler (*Oreothlypis peregrina*)
- One Wilson's warbler (*Cardellina pusilla*)
- Four unidentified birds

Additionally, two bird fatalities (one American coot [*Fulica americana*] and one yellow-bellied sapsucker [*Sphyrapicus varius*]) were found incidentally within search areas, and three birds (two mallards and one unidentified passerine) were found incidentally outside of search areas. The overall bird fatality rate was estimated at 3.64 birds/MW/year, which falls within the range of other fatality estimates at wind projects in Minnesota and the Midwest (reference (54)). No federal or state-threatened or endangered bird species were found as fatalities at the Facility during post-construction fatality monitoring (Appendix M).

At Trimont, six birds were found during standardized carcass surveys (reference (55)):

- One American redstart (*Setophaga ruticilla*)
- One indigo bunting (*Passerina cyanea*)
- One red-eyed vireo (*Vireo olivaceus*)
- One Savannah sparrow (*Passerculus sandwichensis*)
- One sedge wren (*Cistothorus stellaris*)
- One yellow-billed cuckoo (*Coccyzus americanus*)

No federal or state-threatened or endangered bird species were found as fatalities at Trimont during post-construction fatality monitoring in 2021. The overall bird fatality rate was estimated at 0.66 birds/MW/year, which falls at the lower end of the range of other fatality estimates at wind projects in Minnesota and the Midwest (reference (56)).

Additionally, on February 17, 2023, one bald eagle fatality was discovered incidentally at Elm Creek II. The bald eagle carcass was discovered near Turbine V9. As part of the Wildlife Monitoring and Reporting System implemented and permit reporting commitments, this fatality was reported to the USFWS, DNR, and PUC within 24 hours of discovery and identification. Elm Creek II obtained a Bald Eagle General Permit (PER10658505) for the Facility from the USFWS in May 2024.

Based on fatality data from both Elm Creek II and the adjacent Elm Creek I, no significant adverse impacts to birds are anticipated from Project operations following the repowering.

Although the proposed rotor diameter and rotor swept area for up to 62 turbines will be larger than the turbines at Elm Creek I and the existing turbines, the anticipated fatality rate for birds at the Project will likely fall within the overall range of other wind projects in Minnesota and the Midwest. Bird species found as fatalities will likely be composed of the same general species (non-listed and found relatively commonly as fatalities) as those documented at the original Project and at the adjacent projects.

Mammals

Impacts to mammals may occur during construction of the Project; however, using existing access roads as much as possible and restricting speed limits on site is expected to reduce mammal-vehicle collisions. Impacts to ground-based mammals during operation of the Project are expected to be minimal.

Impacts to bats are expected to occur during operation of the Project and are expected to be similar to other facilities in southern Minnesota. Similar to the avian impact analysis, fatality rates documented at Elm Creek II as well as the adjacent Elm Creek I and Trimont projects were examined as potential relevant indicators of the level of bat fatalities expected at the Project after construction is complete. Based on post-construction fatality monitoring data at Elm Creek I from 2009-2010, a total of five bats (two silver-haired bats, one hoary bat, one little brown bat, and one unidentified bat) were found during standardized carcass surveys (reference (53)). Most bat fatalities occurred during the fall migration season,

which is consistent with other studies in North America. Overall, the fatality rate for bats was estimated at 1.49 bats/MW/year, which is also on the low end of the range for fatality rates at other wind projects in the Midwest (reference (53)). No federal or state-threatened or endangered bat species were found as fatalities at Elm Creek I during post-construction fatality monitoring conducted from 2009-2010 (reference (53)).

At Elm Creek II, a total of 17 bats (eight hoary bats, six eastern red bats, and three little brown bats) were found during standardized carcass surveys from 2011-2012 (reference (54)). Additionally, seven bat fatalities (four hoary bats, one eastern red bat, and two little brown bats) were found incidentally within search areas, and two bats (one big brown bat and one silver-haired bat) were found incidentally outside of search areas. The majority of bat fatalities were found during the fall migration season, which is consistent with other studies in North America. Overall, the fatality rate for bats was estimated at 2.81 bats/MW/year, which is within the lower portion of the range for fatality rates at wind projects in Minnesota and the Midwest (reference (54)). No federal or state-threatened or endangered bat species were found as fatalities at Elm Creek II during post-construction fatality monitoring conducted from 2011-2012 (reference (54)).

At Trimont, 14 bats (six hoary bats, five eastern red bats, and three silver-haired bats) were found during standardized carcass surveys from 2020-2021 (reference (55)). No federal or state-threatened or endangered bat species were found as fatalities at Trimont during post-construction fatality monitoring. The overall bat fatality rate was estimated at 1.70 bats/MW/year, which falls at the lower end of the range of other fatality estimates at wind projects in Minnesota and the Midwest (reference (56)).

Bat fatality estimates following the construction of the Project will be relatively similar to other recently constructed wind projects in Minnesota. Although the proposed rotor diameter and rotor swept area for up to 62 turbines will be larger than the turbines at Elm Creek I and the existing Elm Creek II turbines, the anticipated fatality rate for bats at the Project after construction will likely fall within the overall range of other wind projects in Minnesota and the Midwest (several wind facilities have been recently permitted and constructed in Minnesota with rotor diameters of 120 m or greater). Also, bat fatalities will likely be composed of the same general species as those documented at Elm Creek II and at the adjacent projects. See Section 8.21.1 for more context regarding the potential effects that white-nose syndrome (WNS) may have had on little brown bats since the time of the original post-construction fatality monitoring at Elm Creek I (from 2009-2010) and Elm Creek II (from 2011-2012).

Reptiles and Amphibians

Impacts to reptiles and amphibians may occur during repower construction. Implementation of the mitigative measures identified in the original Site Permit for the Project for wetlands and waterbodies will avoid and minimize potential impacts. Impacts to reptiles and amphibians are not expected during operation of the Project.

Insects

Population-level impacts to insect species are not expected from construction or operation of the Project.

Mitigative Measures

Due to the existing Facility, as well as other wind energy facilities in the region, wind turbines are already present on the landscape and in the Project Area. Elm Creek II was sited in areas that have already been disturbed by agriculture and wind project development, and repowering requires minimal, temporary impacts to habitat based on the use of existing turbine and access road layouts. Therefore, only minor, short-term impacts are expected during construction, and population-level impacts to wildlife are not anticipated from continued operation of the Project.

Unless otherwise noted as a change to the original Site Permit conditions, Elm Creek II will follow the mitigative measures identified in Section 5.18 – *Wildlife* of the original Site Permit and the Project's updated Avian and Bat Protection Plan (Appendix M). Elm Creek II provided a draft copy of the revised Avian and Bat Protection Plan to the USFWS and DNR on December 11, 2024. USFWS provided its response on January 8, 2025, and DNR provided its response on February 3, 2025. Neither the USFWS nor the DNR had comments or Project-specific recommendations.

8.21 Rare and Unique Natural Resources

Data on rare and unique natural resources were reviewed for the Project using the USFWS IPaC online tool, the DNR Conservation Explorer online tool, and publicly available datasets from the DNR including Native Plant Communities and Sites of Biodiversity Significance. Although this review does not represent a comprehensive survey, it provides information on the potential for the presence of protected species within the Project Area.

A DNR Natural Heritage Inventory System (NHIS) database review was requested on July 14, 2023, to identify state-listed species that have been documented in the vicinity of the leased lands within the Project Area, where construction activities associated with repowering would be expected to occur. A response letter was received on December 5, 2023 (Appendix J). Results from the NHIS response letter are valid for one year following receipt; therefore, Elm Creek II will resubmit the NHIS review request prior to the start of construction.

8.21.1 Federal and State Listed Species

8.21.1.1 Federal Listed Species

The USFWS IPaC online tool was queried on June 14, 2023 and again on November 27, 2024, for a list of federally threatened and endangered species and designated critical habitat that may be present within the vicinity of the Project Area (Appendix K). The IPaC query identified the prairie bush clover (*Lespedeza leptostachya*; threatened) as potentially occurring in the vicinity of the Project Area. In addition, the following federally listed species were also identified as potentially occurring in the Project Area (reference (57)):

- Northern long-eared bat (endangered)
- Rusty patched bumble bee (*Bombus affinis*; endangered)
- Poweshiek skipperling (*Oarisma poweshiek*; endangered)

- Western prairie fringed orchid (*Platanthera praeclara*; threatened)

No critical habitat was identified within the Project Area in the IPaC.

Northern Long-Eared Bat

Northern long-eared bats have a broad geographic range that encompasses much of the eastern and northern portions of the United States, but the species has declined extensively. The decline is largely due to WNS, a fungal disease that has affected several bat populations (reference (58)). The northern long-eared bat was listed under the ESA primarily because of the threat posed by WNS. The northern long-eared bat was listed as threatened under the ESA by the USFWS on May 4, 2015; on March 31, 2023, the species' listing status was changed to endangered. Following the new listing, the USFWS has published voluntary interim guidance on wind project operations and forest habitat modification. Nearest to the Project Area, WNS has been documented in northern Iowa (Webster County) and southern Minnesota (Olmsted County) as early as 2015 and 2017, respectively (reference (59)).

The northern long-eared bat is considered uncommon and is locally distributed in the majority of its current range, which includes the Project Area. Northern long-eared bats migrate regionally between hibernacula and summer habitat (reference (60)). Studies have reported northern long-eared bat migration movements most commonly range between 40.0 and 50.0 mi (reference (61)). Summer roosting habitat has been found to range between 13 and 65 ac, with most studies finding habitat areas near the low end of the range (reference (62)).Forested areas within the Project Area are highly fragmented and consist of small patches of less than five ac associated with shelterbelts or farmsteads.

A review of USFWS records and DNR databases indicated that there are no known northern long-eared bat summer roost trees or hibernacula within Jackson or Martin counties. Northern long-eared bats were not identified in the NHIS review as being in the vicinity of the leased lands in the Project Area; however, data for the area are not exhaustive. The nearest documented northern long-eared bat summer roost tree to the Project Area is located in Boone County, Iowa, more than 100 mi southeast of the Project Area, and the nearest documented northern long-eared bat hibernaculum is located in Nicollet County, Minnesota, more than 40 mi northeast of the Project Area (reference (60)). It is possible that northern long-eared bats may pass through or forage within the Project Area during migration periods, similar to elsewhere within their range. Even prior to WNS, very few northern long-eared bats were found as fatalities at wind energy projects in the Midwest (10 publicly reported in Iowa, Illinois, Indiana, Michigan, and Missouri, with none in Minnesota; reference (56)), indicating that this species may be at relatively low risk of collision; none were found as fatalities at the original Facility turbines, or the adjacent Elm Creek I or Trimont projects.

Due to the scarcity of forest habitat within the Project Area, location of the Project Area in relation to Minnesota's forested region, and locations of known summer roost trees and hibernacula, occurrence of northern long-eared bats in the Project Area during summer is unlikely. Occurrence during migration is possible.

Prairie Bush Clover

The prairie bush clover inhabits outcrop prairie and mesic to dry prairies (reference (63)). A relatively small area within the Project Area along Elm Creek was mapped by the DNR as a mesic and dry prairie (Section 8.21.2), which could provide suitable habitat for prairie bush clover. However, no prairie bush clover occurrences were noted in the NHIS review as being in the vicinity of the leased lands within the Project Area.

Rusty Patched Bumblebee

The rusty patched bumble bee relies on blooming flowers to forage during the growing season. They will forage in forests, wetlands, grasslands, agricultural fields, and parks (reference (64)). They nest underground, often in old rodent burrows (reference (65)). Since they are generalists and will use a range of habitats from forests to agricultural fields, there is habitat for the species in the Project Area. USFWS has delineated "High Potential Zones" around recent rusty patched bumble bee records where the rusty patched bumble bee is assumed to be present in suitable habitat. Surrounding the High Potential Zones are primary dispersal zones, which the USFWS has determined to have "low potential" for rusty patched bumble bee occurrence. According to the USFWS, rusty patched bumble bees are not likely to be present in the low-potential zones (reference (66)). The Project Area does not overlap any high or low potential zones, with the nearest mapped high potential zone 14 mi (23 km) to the northwest (reference (66)). Also, no rusty patched bumblebee occurrences were noted in the NHIS review as being in the vicinity of the leased lands within the Project Area. Therefore, the occurrence of the rusty patched bumble bee in the Project Area is unlikely.

Poweshiek Skipperling

The Poweshiek skipperling uses a range of native prairies but will not use sand prairies (reference (67)). They can also be found in prairie fens and stream margins. They have not been found in reconstructed prairies (reference (68)). Though they have a range that overlaps with the Project Area, there is a lack of suitable habitat for them in the Project Area, outside of one small section of native prairies mapped in the northeastern portion of the Project Area along Elm Creek. The Poweshiek skipperling does not migrate, so isolation of grassland habitats by means of development and agricultural practices has proven detrimental (reference (69)). Poweshiek skipperling was not identified in the NHIS review as being in the vicinity of the leased lands within the Project Area. Due to the general lack of native prairies in the Project Area, and due to the lack of nearby records and the species' general lack of mobility, the occurrence of the Poweshiek skipperling is unlikely.

Western Prairie Fringed Orchid

Western prairie fringed orchids occur almost exclusively in native habitats (reference (70)). Although historic records of western prairie fringed orchids exist in Martin County, Minnesota, the records likely represent extirpated populations (reference (70)). There is a lack of suitable habitat for western prairie fringed orchid in the Project Area, except for one small section of DNR-mapped native prairie in the northeastern portion of the Project Area along Elm Creek. However, western prairie fringed orchid was not identified in the NHIS review as being in the vicinity of the leased lands within the Project Area, including within the DNR-mapped native prairie. Because previous populations in Minnesota have likely been

extirpated, there are no records in the Project vicinity, and the Project Area contains relatively few areas of high-quality habitats, occurrence of this species within the Project Area is unlikely.

8.21.1.2 Federal Proposed and Under Review Species

The USFWS IPaC online tool was queried on June 14, 2023, and again on November 27, 2024, for a list of federally proposed and candidate species that may be present within the vicinity of the Project Area (Appendix K). The IPaC query identified the western regal fritillary (*Argynnis idalia occidentalis*) and the monarch (*Danaus Plexippus*), species proposed to be federally listed as threatened, as potentially occurring in the vicinity of the Project Area. In addition, the tri-colored bat (proposed to be federally listed as endangered) and the little brown bat (under review for federal listing) were also identified as potentially occurring in the vicinity of the Project Area (reference (57)).

Tri-Colored Bat

Due largely to the effects of WNS, the tri-colored bat was proposed by the USFWS to receive endangered status on September 14, 2022 (reference (49)); a final ruling has not occurred. During the spring, summer, and fall, the tri-colored bat is typically associated with forested habitats and occasionally in manmade structures such as barns, above porches, and bridges (references (71); (72)). Forested habitat within the Project Area is limited, and tri-colored bats were not identified in the NHIS review as being in the vicinity of the leased lands within the Project Area; however, data for the area are not exhaustive. Due to a general lack of preferred habitat, lack of known DNR records, and the effect of WNS, tri-colored bats are not expected to occur in the Project Area. However, due to the species' range, summer presence at the Project Area is possible and migration through the Project Area during the operational life of the repowered Project is likely. Relatively few tricolored bats have been documented as fatalities in Minnesota (reference (56)); none were found as fatalities at the original Facility turbines, or the adjacent Elm Creek I or Trimont projects.

Little Brown Bat

In the winter, little brown bats will roost in caves and mines. During migration and in the summer, little brown bats often roost in manmade structures, but will also use forested areas in tree snags and cavities (reference (73)). Foraging often occurs in forested areas near water. Scattered outbuildings, woodlots and forested riparian areas that could potentially provide roosting and foraging habitat are present in the Project Area. Little brown bats were not identified in the NHIS review as being in the vicinity of the leased lands within the Project Area; however, data for the area are not exhaustive. Following the bat habitat assessment within the Project Area (Appendix L), approximately 30 ac of potentially suitable habitat were identified, primarily limited to relatively small, isolated patches. Summer presence at the Project Area is possible and migration through the Project Area is likely.

Little brown bats were found as fatalities during post-construction fatality monitoring at the original Facility turbines (conducted from 2011-2012) and the adjacent Elm Creek I (conducted from 2009-2010), which shows they were historically present in the Project Area prior to the first confirmed case of WNS in southern Minnesota. WNS was first confirmed in southern Minnesota in 2015/2016, and has since become more widespread throughout the state, with most positive WNS cases being recorded in 2016/2017

(reference (59)). Although WNS has not been officially documented in Jackson or Martin counties, intensive WNS sampling has not occurred in Minnesota, and all cave-hibernating bats should be assumed to be affected by WNS in Minnesota, regardless of known occurrence in the specific county (reference (59)).

Several studies have documented population declines ranging from 30 to 99 percent for little brown bats following the introduction of WNS (references (74); (75)). Although specific population estimates are not available for Minnesota, little brown bat populations in the state have likely decreased since the original Facility was constructed. As noted, no little brown bat fatalities were documented during the 2020-2021 post-construction fatality monitoring at the nearby repowered Trimont project. Because post-construction fatality surveys were not conducted at the original Trimont project, direct comparisons pre- and post-WNS are not possible. However, the fact that no little brown bats were found at this repowered facility, which is adjacent to the Elm Creek projects in similar habitats, does suggest that the little brown bat population in this vicinity (and associated relative risk from turbine collision) may have declined.

Monarch Butterfly

Due largely to habitat loss, the monarch butterfly was proposed by the USFWS to receive threatened status on December 12, 2024 (reference (76)). Monarch butterflies are found in areas with a high number of flowering plants, which provide sources of nectar. Monarch butterflies rely exclusively on the presence of milkweed (*Asclepias* spp.) to complete the caterpillar life stage (reference (77)). Monarch butterflies were not identified in the NHIS review as being in the vicinity of the leased lands within the Project Area; however, because they are not a state-listed species, occurrence data from the NHIS review are not exhaustive. Suitable habitat for monarch butterflies is present in the non-agricultural areas of the Project Area, including along roadside ditches and right-of-way.

Western Regal Fritillary

Due largely to habitat loss, the western regal fritillary was proposed by the USFWS to receive threatened status on August 6, 2024 (reference (78)). The western regal fritillary is associated with both upland and wet native prairies; grasslands must be relatively large (generally more than 2,471 ac [1,000 ha]) and contiguous, maintained by periodic disturbance to be considered suitable for the species (reference (78)). Many of the native prairies in Minnesota are no longer large enough to sustain a population of regal fritillaries (reference (79)). Though they have a range that overlaps with the Project Area, there is a lack of suitable habitat in the Project Area, except for one small section of DNR-mapped native prairie in the northeastern portion of the Project Area along Elm Creek and an isolated DNR-mapped native prairie along an unnamed tributary to Elm Creek. However, the regal fritillary was not identified in the NHIS review as being in the vicinity of the leased lands within the Project Area, including within the DNR-mapped native prairies. The regal fritillary does not migrate, so isolation of grassland habitats by means of development and agricultural practices has proven detrimental (reference (69)). Due to the general lack of native prairies in the Project Area, and due to the lack of nearby records and the species' general lack of mobility, the occurrence of the western regal fritillary is unlikely.

8.21.1.3 State-Listed Species

In June 2023 and November 2024, the DNR Rare Species Guide was queried for all state-listed species with potential to occur within Jackson and Martin counties. These include species state-listed as endangered, threatened, and SPC. Although not protected by state laws, Minnesota SPC are extremely uncommon or have unique or highly specific habitat requirements and could require special monitoring of their status (reference (80)). Species on the periphery of their range or species previously listed as threatened or endangered that now have stable populations may also be included in this category. The results of the Rare Species Guide query are presented in (reference (57)). Species state-listed as endangered or threatened with potential to occur in the Project Area include one mammal, five birds, one reptile, three mollusks, three insects, and seven plants (reference (57)). State SPC species with potential to occur in the Project Area include two mammals, seven birds, one amphibian, two mussels, three insects, and seven plants.

An NHIS request was submitted on July 14, 2023, to identify state-listed species that have been documented in the vicinity of the leased lands within the Project Area. A response letter was received on December 5, 2023. Results from the NHIS response letter are valid for one year following receipt; therefore, Elm Creek II will resubmit the NHIS review request prior to the start of construction. The NHIS review documented records of three species in the vicinity of the leased lands within the Project Area: Sullivant's milkweed (*Asclepias. sullivantii*; state-listed as threatened) and two species of caddisfly (*Limnephilus secludens* [state-listed as endangered] and *Ironoquia punctatissima* [state-listed as threatened]). No species of concern were documented during the 2023 site visits.

Sullivant's Milkweed

Sullivant's milkweed is restricted to undisturbed wet and mesic tallgrass prairies (reference (81)). The database record of Sullivant's milkweed from the NHIS review was documented near the leased lands within the Project Area. A relatively small area within the Project Area along Elm Creek was mapped by the DNR as a native mesic prairie (Section 8.21.2). This area could provide potential habitat for this species.

A Caddisfly (Limnephilus secludens)

Limnephilus secludens is a species of northern caddisfly that was once abundant in northwestern and some parts of southern Minnesota prior to 1950 (reference (82)). Caddisflies typically rely on slow moving water sources, such as small streams; however, the specific habitat requirements of *Limnephilus secludens* remain largely unknown (reference (82)). Because the species depends on terrestrial food sources, they are sensitive to changes or disturbance in riparian corridors associated with their riverine habitats (reference (82)). Although common prior to 1950, only one *Limnephilus secludens* was found during statewide surveys in 1999; the single occurrence was found near Elm Creek within the Project Area in a small unnamed stream tributary of Watkins Lake (reference (83)). None have been found since then (as of the 2012 report; State of Minnesota reference (83)). The NHIS review noted an occurrence of *Limnephilus secludens* near Elm Creek in the northeast portion of the leased lands within the Project Area, within the Elm Creek 5 DNR SBS; however, the date of this occurrence is not provided.

A Caddisfly (Ironoquia punctatissima)

Ironoquia punctatissima is a species of northern caddisfly that is common in the eastern U.S. (reference (84)). Within Minnesota, occurrences are limited to Lyon, Martin, Watonwan, and Washington counties (reference (84)). *Ironoquia punctatissima* are restricted to very small cold-water springs. In southern Minnesota, these habitats are scarce and vulnerable to disturbance in the riparian corridors (reference (84)). The NHIS review identified an occurrence of *Ironoquia punctatissima* near Elm Creek inside the leased lands in the Project Area, within the Elm Creek 5 SBS.

8.21.1.4 State Special Concern Species

Two avian species state-listed as SPC were identified in the IPaC as having potential to occur in the Project Area, including Franklin's gull (*Leucophaeus pipixcan*; also a BCC; potential occurrence during breeding and migration) and marbled godwit (*Limosa fedoa*; also a BCC; breeding and migration). Occurrence for both species would be infrequent, limited to breeding and migration. Habitat for these species include wetlands and waterbodies, which are relatively limited within the Project Area. Neither of these species, or any other avian SPC species were found as fatalities during post-construction fatality monitoring at the original Elm Creek II turbines (from 2011-2012; reference (54)), or at the adjacent Elm Creek I (2009-2010; reference (53)) or Trimont (2020-2021; reference (55)) wind projects. No SPC species were identified in the NHIS review within the leased lands in the Project Area.

8.21.1.5 Impacts and Mitigative Measures

Federal Listed Species

The Project would not require tree removal or removal of structures such as outbuildings; as such, impacts to northern long-eared bats, tri-colored bats, and little brown bats are not anticipated during Project construction. Elm Creek II will review Project operational activities for potential impacts on the species as part of post-construction fatality monitoring, develop appropriate avoidance and minimization measures, and consult with the USFWS as appropriate.

Construction workspaces for the Project would primarily occur in mowed areas or cultivated cropland and would avoid areas of native vegetation to the extent practicable. However, some minor and temporary impacts on wetlands, grasslands, and shrubland may occur because of construction workspaces; these communities could contain flowering vegetation that would serve as a food source for monarch butterflies, rusty patched bumblebees, Poweshiek skipperlings, or regal fritillaries. If the USFWS determines the monarch butterfly or the western regal fritillary should be listed and protections for the species coincides with Project planning, permitting, and/or construction, Elm Creek II will review Project activities for potential impacts on the species, develop appropriate avoidance and minimization measures, and consult with the USFWS as appropriate.

Impacts to prairie bush clover and western prairie fringed orchid are not anticipated from the Project. Although prairie habitat is present in the Project Area, the Facility's infrastructure is not located within these prairie communities and the Project does not involve the placement of new infrastructure or permanent impacts within these prairie communities. As Project design and the construction footprint are finalized, grassland habitat impacts will be re-evaluated. If necessary, a subsequent field evaluation of

potential native prairies within the Project Area will occur prior to construction activities to further document the presence and quality of grassland habitats in the vicinity of proposed disturbance associated with the repower activities. Elm Creek II will continue to review Project activities for potential impacts on any species identified as potentially affected, develop appropriate avoidance and minimization measures, and consult with the DNR and USFWS as appropriate.

State-Listed Species

Impacts to Sullivant's milkweed are not anticipated from Project repower construction or operation. The NHIS review recommended that disturbance of native prairies be avoided. Although DNR-mapped native prairie habitat is present in the Project Area, the Facility is not located within these DNR-mapped native prairies and proposed activities associated with the repower will not occur in these communities. As Project design and the construction footprint are finalized, grassland habitat impacts will be re-evaluated. If necessary, a subsequent field evaluation of potential native prairies within the Project Area will occur prior to construction activities to further document the presence and quality of grassland habitats in the vicinity of proposed disturbance associated with the repower activities.

Impacts to the two state-listed caddisfly species identified in the NHIS review (*Limnephilus secludens* and *Ironoquia punctatissima*) are not anticipated from the Project. The NHIS review recommended that the Elm Creek 5 SBS should be treated as an avoidance area. The Facility's infrastructure is not located within the Elm Creek 5 SBS, and the Project does not involve the placement of new infrastructure or permanent impacts within the SBS. Following DNR recommendations to avoid or minimize disturbance to the Elm Creek 5 SBS, the temporary disturbance area associated with Turbine M2 was shifted west to avoid overlapping the SBS. The outer extent of this temporary disturbance area occurs approximately 800 ft west of Elm Creek, outside of the riparian area adjacent to Elm Creek. All impacts to this SBS will be avoided. The temporary workspace for Turbine M2 will be appropriately sited and staked to completely avoid this SBS prior to construction.

Mitigative Measures

Due to the existing Facility, as well as other wind energy facilities in the region, wind turbines are already present on the landscape and in the Project Area. The Project was sited in areas that have already been disturbed by agriculture and wind project development; population-level impacts to wildlife are not anticipated from construction or operation of the Project.

Unless otherwise noted as a change to the original Site Permit conditions, Elm Creek II will follow the mitigative measures identified in Section 5.19 – *Rare and Unique Natural Resources* of the original site permit during turbine retrofit activities and the updated Avian and Bat Protection Plan (Appendix M).

8.21.2 Sites of Biodiversity Significance, Native Plant Communities, and Native Prairie

Four SBS are located within the Project Area: three ranked moderate and one ranked below with regards to biodiversity significance (Map 18). Three of these SBS were noted in the NHIS review as occurring in the leased lands within the Project Area, including two ranked as moderate and one ranked as below. Areas

ranked as "moderate" contain significant occurrences of rare species and/or moderately disturbed native plant communities and landscapes that have a strong potential for recovery. Areas ranked as "below" lack occurrences of rare species and natural features or do not meet standards for a ranking of moderate or higher. Acreage of each SBS within the Project Area is summarized in Table 8-24.

Table 8-24 Sites of Biodiversity Significance within the Elm Creek II Project Area

Site of Biodiversity Significance Name	Rank	Acres in Project Area
Cedar 31	Moderate	52.2
Elm Creek 5	Moderate	176.4
Elm Creek 7	Moderate	1.3
Elm Creek 8	Below	5.7

South Dakota State University developed a dataset of potentially undisturbed lands (PUDL), specifically grasslands and forested areas. This dataset extends into a portion of southwestern Minnesota, including the portion of the Project Area in Jackson County. Nine areas of PUDL, including all grasslands except for one woodland, were identified within the Project Area (Map 18). One area identified as PUDL was located in the western portion of the Project Area overlapping with the Artz State WMA (also identified in the NHIS review).

The DNR identified several native plant communities in the northeast part of the Project Area (Map 18, Table 8-25). The native plant communities consist of three types, including a prairie wetland complex (PWL-CX), dry hill prairie (southern; Ups13d) and mesic prairie (southern; Ups23a). Except for one isolated small southern dry hill prairie, the remaining native plant communities occur as a complex along Elm Creek in the Elm Creek 5 SBS (Map 18). The DNR assigns each native plant community a state conservation status as follows:

- S1 – Community is critically imperiled
- S2 – Community is imperiled
- S3 – Community is vulnerable to extirpation or extinction
- S4 – Community is apparently secure
- S5 – Community is demonstrably widespread, abundant, and secure

The acreage of each native plant community type and associated conservation status is identified in Table 8-25.

Table 8-25 Native Plant Communities/Native Prairie within the Elm Creek II Project Area

Native Plant Community Type	Conservation Status	Acres in Project Area
Prairie Wetland Complex	S1-S3	92.6
Dry Hill Prairie (Southern; Ups13d)	S2	30.2
Mesic Prairie (Southern; Ups23a)	S2	15.1

The DNR does not identify any lands within the Project Area that are enrolled in the Native Prairie Bank Program.

8.21.2.1 Impacts and Mitigative Measures

A field visit was conducted on October 3, 2023, to assess the quality of the habitat within the portion of the Elm Creek 5 SBS that borders the temporary disturbance area associated with Turbine M2. The SBS contained a moderate amount of native grasses and forbs (greater than 50 percent), although evidence of reseeding was noted. A desktop review of historical aerial imagery revealed that the portion of the SBS near the turbine was farmed as recently as 2003 and subsequently reseeded as grassland. Following DNR recommendations to avoid or minimize disturbance to the Elm Creek 5 SBS, the temporary disturbance area associated with Turbine M2 was shifted west to avoid overlapping the SBS. The Facility's infrastructure is not located within the Elm Creek 5 SBS, and the Project does not involve the placement of new infrastructure or permanent impacts within the SBS. All impacts to the Elm Creek 5 SBS will be avoided.

The NHIS review recommended Elm Creek II maintain a minimum 0.25-mi setback from all WMAs for wind turbines, including the Artz WMA. The nearest existing turbine at the Project is 0.20 mi southeast of the Artz WMA. Further discussion regarding the Artz WMA is included in Table 5-1 and Section 8.8. Because the Project already includes existing turbines, any nominal impacts related to the repower effort, such as construction-related noise or increased traffic, will be temporary and limited to construction. Therefore, no mitigative measures are proposed.

The NHIS review recommended Elm Creek II avoid or minimize disturbance to the DNR-mapped native communities in the leased lands within Project Area. All areas of permanent and temporary disturbance are located outside of the mapped SBS, PUDL, and native plant communities. As such, impacts to these resources are not anticipated from the Project and no other mitigative measures are proposed.

8.22 Climate

8.22.1 Existing Environment and Potential Future Conditions

The DNR Minnesota Climate Trends tool provides a summary of historical climate data for various regions across Minnesota (reference (3)). The climate data that is presented in this tool was collected from nationally available sources including the National Oceanic and Atmospheric Administration's National

Centers for Environmental Information (reference (4)), and the Parameter-elevation Regression on Independent Slopes Model Climate Group (reference (5)).

Table 8-26 shows temperature changes from the DNR Minnesota Climate Trends tool data for Jackson and Martin Counties from 1895 to 2023 and from 1994 to 2023 to represent the full record of data and the most recent 30-year climate normal period, respectively. In each temperature statistic, Jackson and Martin Counties exhibited an increase in daily temperature from 1895 to 2023. The annual minimum daily temperature has increased at the largest rate of the three temperature statistics.

Table 8-26 Historical Temperature Trends for Jackson and Martin Counties

Metric	Timeframe	Temperature Change (degrees Fahrenheit/decade)
Annual Average Temperature	1895-2023	+ 0.19
Annual Average Temperature	1994-2023	+ 0.33
Annual Maximum Temperature	1895-2023	+ 0.08
Annual Maximum Temperature	1994-2023	+ 0.23
Annual Minimum Temperature	1895-2023	+ 0.29
Annual Minimum Temperature	1994-2023	+ 0.42

Table 8-27 shows precipitation changes from the DNR Minnesota Climate Trends tool data for Jackson and Martin Counties. Total annual precipitation has increased from 1895 to 2023 by a rate of 0.30 in/decade and from 1994 to 2023 by a rate of 1.38 in/decade.

Table 8-27 Historical Precipitation Trends for Jackson and Martin Counties

Metric	Timeframe	Precipitation Change (in./decade)
Total Annual Precipitation	1895-2023	+ 0.30
Total Annual Precipitation	1994-2023	+ 1.38

Future projections are based on the Minnesota dynamically downscaled climate model data that was developed by the University of Minnesota (reference (85)). They are summarized in three scenarios, Shared Socioeconomic Pathway (SSP) 245, SSP370, and SSP585. SSP is a measure adopted by the Intergovernmental Panel on Climate Change to represent various greenhouse gas (GHG) concentration pathways as well as social and economic decisions (reference (86)).

SSP245 represents a "Middle of the Road" scenario where economic, social, and technological trends follow historical patterns, population growth is moderate, and inequality persists. Additionally, SSP245 includes an intermediate emissions scenario, where a net radiative forcing of 4.5 watts per meter squared (W/m2) is received by the earth due to the GHG effect and emissions begin to decrease around 2040.

SSP370 represents a "Regional Rivalry" scenario where nations focus on regional issues instead of cross-collaboration and development. SSP370 also includes a high emissions scenario, where a net radiative forcing of 7.0 W/m2 is received by the earth.

SSP585 represents a "Fossil-fueled Development" scenario where there is increased development in competitive markets driven by an increased global consumption of fossil fuels. SSP585 also includes a very high emissions scenario, where a net radiative forcing of 8.5 W/m2 is received by the earth and no emissions are reduced through 2100.

Table 8-28 shows the model historical and projected temperature values at the Project. Under all scenarios for each statistic, temperature values are projected to increase through the end of the 21st century. The largest increases occurring in the minimum daily temperature under each scenario.

Table 8-28 Modeled Historical and Projected Temperature Trends at the Project

Scenario	Time Period	Average Daily Temperature (°F) - Ensemble Mean	Minimum Daily Temperature (°F) - Ensemble Mean	Maximum Daily Temperature (°F) - Ensemble Mean
Historical	1995-2014	45.4	35.9	58.0
ssp245	2040-2059	49.2 (3.7)	39.7 (3.9)	61.6 (3.6)
ssp245	2060-2079	50.4 (4.9)	41.0 (5.1)	62.7 (4.7)
ssp245	2080-2099	52.1 (6.6)	42.6 (6.7)	64.6 (6.5)
ssp370	2040-2059	50.6 (5.1)	40.8 (4.9)	63.5 (5.4)
ssp370	2060-2079	52.6 (7.2)	42.9 (7.0)	65.4 (7.3)
ssp370	2080-2099	54.3 (8.9)	44.9 (9.0)	66.9 (8.9)
ssp585	2040-2059	49.7 (4.3)	40.3 (4.4)	62.3 (4.2)
ssp585	2060-2079	52.3 (6.9)	43.0 (7.1)	64.7 (6.7)
ssp585	2080-2099	56.6 (11.1)	47.4 (11.6)	68.6 (10.6)

Table 8-29 shows the model historical and projected precipitation values at the Project. Under the SSP245, a slight increase in precipitation followed by a decrease in precipitation is projected. Under SSP370, a decrease in precipitation from modeled historical values is projected to occur under all time periods (largest occurring before 2080). For SSP585, a slight decrease in precipitation from modeled historical values is projected followed by a sharp increase in precipitation by the end of the century.

Table 8-29 Modeled Historical and Projected Precipitation Trends at the Project

Scenario	Time Period	Total Annual Precipitation (in) - Ensemble Mean
Historical	1995-2014	31.8
ssp245	2040-2059	32.6 (0.3)
ssp245	2060-2079	33.1 (-0.3)
ssp245	2080-2099	30.1 (-0.2)
ssp370	2040-2059	26.4 (-3.4)
ssp370	2060-2079	28.0 (-3.1)
ssp370	2080-2099	30.4 (-0.7)
ssp585	2040-2059	31.2 (-0.7)
ssp585	2060-2079	33.9 (1.2)
ssp585	2080-2099	34.6 (2.4)

The EPA Climate Resilience Evaluation and Awareness Tool (anticipates an increase in 100-year storm intensity of 4.1 to 15.1 percent in 2035 and 7.9 to 29.4 percent in 2060 at the Project Area (reference (8)). The EPA Streamflow Projections Map anticipates a change in average streamflow of Elm Creek (NHD reach code: 07020009000041) by a ratio of 1.25 (90th percentile) under wetter projections and a ratio of 0.99 (10th percentile) under drier projections in 2071 to 2100 (RCP 8.5) compared to baseline historical flow (1976 to 2005) (reference (9)).

8.22.2 Potential Impacts of Climate Change on the Project

With an anticipated increase in 100-year storm intensity at the Project Area and an assumed increase in streamflow of Elm Creek, there is potential for waterways to be subject to greater amounts of erosion.

Periods of drought may also be possible. Elm Creek II will obtain any necessary permits to appropriate water during construction or operation, if needed. Increased variability in temperature associated with climate change is not anticipated to affect construction or long-term operations of the Project.

The Project infrastructure has been designed and constructed to industry and jurisdictional standards and the impacts of climate change on the Project are anticipated to be minimal.

8.23 Greenhouse Gas Emissions

Anthropogenic carbon dioxide (CO_2) emissions are responsible for about two-thirds of the energy imbalance that is causing Earth's temperature to rise, which has direct and cascading effects on weather, vegetation, agriculture, disease, availability of water, and ecosystems (reference (87)). Climate change and decarbonization have been discussed for decades at all levels of government, as well as in global, national, and local institutions. There is general agreement that immediate and large-scale progress toward carbon

neutrality is needed. Many countries have announced decarbonization initiatives. The first binding global agreement, the Paris Agreement, was established in 2016. The Paris Agreement goal is to keep the rise in mean global temperature to well below 2 degrees Celsius, and preferably limit the increase to 1.5 degrees Celsius above pre-industrial levels. To meet this goal, global emissions will need to be reduced as soon as possible and reach net-zero by the middle of the 21st century (reference (88)).

The State of Minnesota has also established a goal for the reduction of GHG emissions, set forth in Minn. Stat. § 216H.02, subd. 1:

> It is the goal of the state to reduce statewide GHG emissions across all sectors producing those emissions to a level at least 15 percent below 2005 levels by 2015, to a level at least 30 percent below 2005 levels by 2025, and to a level at least 80 percent below 2005 levels by 2050. The levels shall be reviewed based on the climate change action plan study.

Per Minnesota Statute 216B.1691 Renewable Energy Objectives, which became effective in 2023, all electric utilities are required to generate or procure 100 percent of electricity sold to Minnesota customers from carbon-free sources by 2040, with an interim goal of 80 percent carbon-free electricity by 2030. Carbon-free sources are those that generate electricity without emitting CO_2. Electric utilities are also required to generate or procure 55 percent of electricity sold to Minnesota customers from an eligible energy technology by 2035. Eligible energy technology includes technology that generates electricity from solar, wind, and certain hydroelectric, hydrogen, and biomass sources (Minnesota Statutes, section 2165.1691).

8.23.1 Project Greenhouse Gas Emissions

The Project involves retrofitting existing wind turbines by replacing turbine equipment with new components. GHG emissions have been calculated for the construction and annual operation of the Project.

8.23.1.1 Construction Greenhouse Gas Emissions

Identified GHG emissions associated with the construction of the Project consist of direct emissions generated from mobile combustion. Indirect emissions associated with the construction of the Project consist of the GHG emissions associated with electrical consumption. Due to the anticipated temporary land disturbance during construction, there is potential for a reduction of the amount of carbon uptake from the land cover in the area.

Emission factors used to calculate emissions from mobile combustion are based on the EPA Emissions for Greenhouse Gas Inventories 2024 Emission Factors Hub (reference (89)). The indirect emissions from electrical consumption were calculated based on the EPA Emissions & Generation Resource Integrated Database for the Midwest Reliability Organization West subregion (reference (90)). These emission factor sources were also used for operation emissions calculations.

Due to the short construction time and because temporarily disturbed areas will be restored to pre-construction conditions, minimal GHG impacts from construction activities are anticipated.

Table 8-30 summarizes the estimated Project construction GHG emissions; associated calculations are summarized in Appendix N. The total Project construction emissions are estimated to be approximately 1,281 metric tons CO_2e. Gasoline fuel combustion emission sources include commuter vehicles. Diesel fuel combustion emission sources include construction equipment. The estimated total annual electrical consumption is approximately 31,500 kWh.

Table 8-30 Summary of Construction GHG Emissions

Emission Source	Source Type	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2e[1] (metric tons)
Fuel Combustion	Direct	1,234.23	0.15	0.11	1,267.14
Electrical Consumption	Indirect	13.38	1.46E-03	2.14E-04	13.48
TOTAL	ALL SOURCES	1,247.61	1.48E-01	1.09E-01	1,280.61

[1] Global Warming Potentials from EPA CCCL Emission Factors for Greenhouse Gas Inventories, 2024.

8.23.1.2 Operational Greenhouse Gas Emissions

Identified GHG emissions associated with the operation of the Project consist of direct emissions generated from fuel combustion sources. Indirect emissions associated with the operation of the Project include the GHG emissions associated with electrical consumption.

Table 8-31 summarizes the estimated Project operational GHG emissions; associated calculations are summarized in Appendix N. The total Project operation emissions are estimated to be approximately 417 metric tons CO_2e annually. Gasoline fuel combustion emission sources include trucks, UTVs, lawnmowers, and portable generators. Diesel fuel combustion emission sources include a skid steer. The estimated total annual electrical consumption is approximately 757,000 kWh based on the 2022 station power estimates.

Table 8-31 Summary of Operational GHG Emissions

Emission Source	Source Type	CO_2 (metric tons/year)	CH_4 (metric tons/year)	N_2O (metric tons/year)	CO_2e[1] (metric tons/year)
Fuel Combustion	Direct	89.85	2.17E-02	1.10E-02	93.39
Electrical Consumption	Indirect	321.57	3.50E-02	5.15E-03	323.91
TOTAL	ALL SOURCES	411.42	5.68E-02	1.61E-02	417.30

[1] Global Warming Potentials from EPA CCCL Emission Factors for Greenhouse Gas Inventories, 2024.

Even though the Project anticipates emitting minimal GHG emissions, Elm Creek II will continue to assist in achieving the GHG emissions reduction and carbon-free electricity goals outlined by the state of Minnesota, as well as other national and international goals. This is due in part to the overall offset of the wind power generated from the Project that would otherwise be generated via fossil fuels and contribute further to global warming and climate change. Overall, the Project leads to a net reduction of CO_2 emissions and associated climate change impacts.

9 Site Characterization of Wind Resources

9.1 Site Wind Characteristics

The wind monitoring program at the Project began in September 2006 with MET Mast 437 and ended in 2011 for all masts except Mast 913 which was decommissioned in December 2014. Table 9-1 shows the MET mast data for the Elm Creek II Wind Facility.

Table 9-1 Mast data for the Elm Creek II Wind Facility

Mast / Remote Sensing ID	WGS84		Elevation [m]	Measurement heights [m]	Temperature measurement heights [m]	Measurement period	
	Latitude	Longitude				Start	End
910	43.659067	-94.93325	431	58, 58, 50, 50, 32, 32	2	2/27/2008	11/10/2011
911	43.699817	-94.913417	419	58, 58, 50, 50, 32, 32	2	2/28/2008	11/9/2011
912	43.681483	-94.8738	409	58, 58, 50, 50, 32, 32	2	3/2/2008	8/12/2011
913	43.755367	-94.823617	391	60, 60, 50, 50, 30, 30	3	4/24/2009	12/13/2014
437	43.74001	-94.92467	409	60, 59, 50, 30	2	9/9/2006	8/8/2011

Wind speed and temperature data from the MET masts were adjusted to align with data from the selected long-term reference sources, Vortex ERA5 and MERRA2, which are shown in Table 9-2. An r-squared value can range from 0-1, the higher r-squared value the stronger the correlation.

Table 9-2 Correlation of MET Data with Reference Sites – Results of Weekly Correlation Study, LT vs 911 Mast

Reference Data Set	R2	VLT911
Vortex ERA5 & MERRA2	0.91	7.51

9.1.1 Interannual Variation

Interannual variation is the variation in wind speed from one year to the next. The interannual variability of wind speed at the Project is estimated to be 2.6-2.9%.

9.1.2 Seasonal Variation

Seasonal variation is represented by the shift in production percent (correlated to wind speeds) from one month to the next. Table 9-3 shows the estimated average seasonal variation based on long-term correlations with MET data collected in the Project Area. The months of October through May are

expected to generally have the highest wind speeds, while the months of June through August are expected to have the lowest wind speeds.

Table 9-3 Average Monthly Production Percent at Hub Height of Repowered Turbines

Month	Production
January	9.3%
February	8.8%
March	8.0%
April	10.0%
May	9.1%
June	6.5%
July	5.8%
August	5.8%
September	8.0%
October	8.6%
November	9.4%
December	10.6%

9.1.3 Diurnal Conditions

As shown in Figure 9-1, the annual daily wind speed pattern at the proposed repower hub height based on the Project's MET Mast 911 shows an increase in wind speeds during the evening and overnight hours.

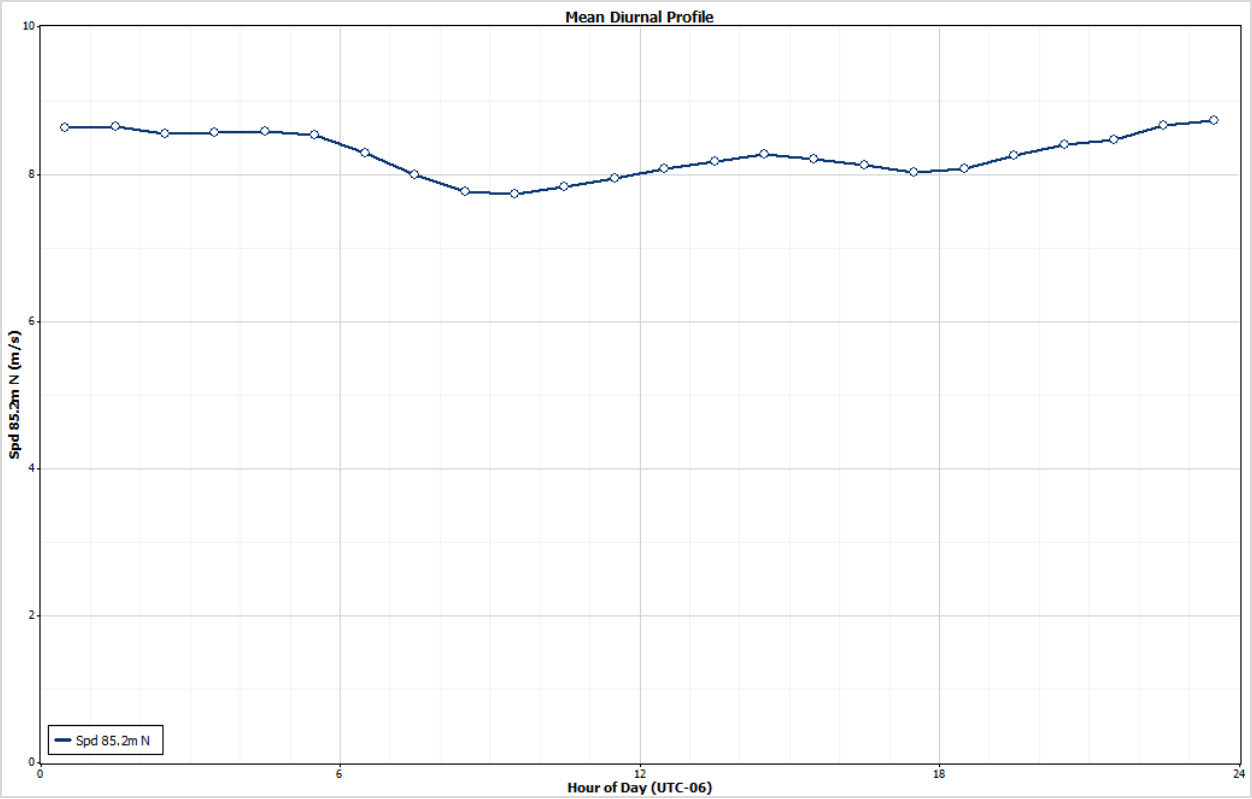

Figure 9-1 Diurnal Wind Speeds

9.1.4 Hub Height Turbulence

Turbulence intensity (TI) is an indicator of the variability of wind speed. Hub height TI for the repowered Project is on average 8.9 percent at 15 m/s as calculated by Vestas for the Elm Creek II mechanical loads analysis with the V120 2.2 MW turbine models.

9.1.5 Extreme Wind Conditions

The repowered hub height 50-year extreme 10-minute wind speed for the Project Area is 37.6 m/s. The extreme wind speed was calculated by Vestas for the Elm Creek II mechanical loads analysis with the V120 2.2 MW turbine models.

9.1.6 Wind Speed Frequency Distribution

Figure 9-2 shows the wind speed frequency distribution at repowered hub height calculated from wind data collected at MET Mast 911.

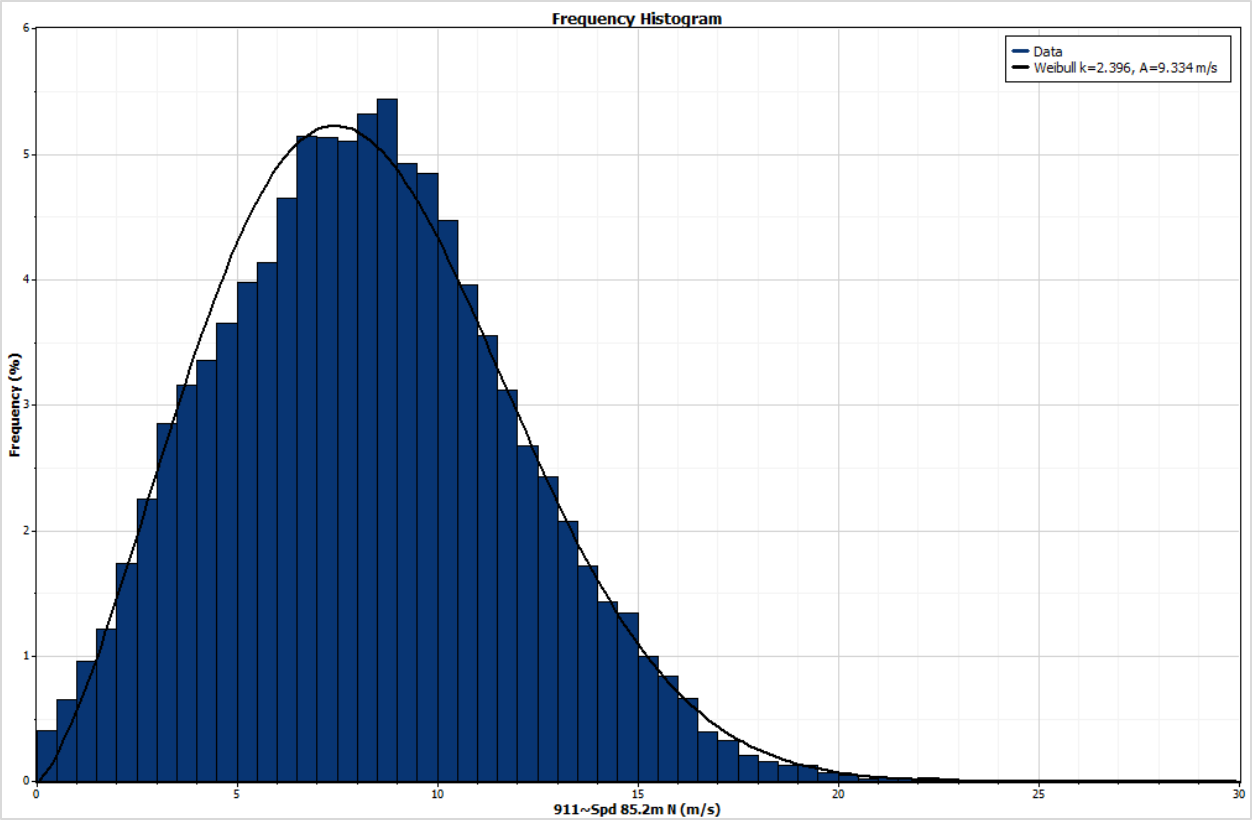

Figure 9-2 Wind Speed Frequency Distribution

9.1.7 Wind Variation with Height

Table 9-4 shows wind speed at the instrument height, wind shear exponent, and the extrapolated hub height wind speed.

Table 9-4 Mast data for Elm Creek II Facility

MET Mast	Measurement height [m]	V_{LT_MHm} [m/s]	Average Shear	V_{LT_HHm} [m/s]
910	58	7.62	0.21	8.26
911	58	7.51	0.21	8.16
912	58	7.33	0.25	8.06
437	60	7.30	0.25	7.97

9.1.8 Spatial Wind Variation

Elm Creek II has estimated the annual average hub height wind speeds among the Project's up to 62 turbines averaging approximately 7.7 m/s.

9.1.9 Wind Rose

A wind rose is a graphical representation of wind speeds based on the direction the wind comes from and the frequency it comes from each direction. Figure 9-3 shows the Project's wind rose based on information from on-site met masts at Elm Creek II.

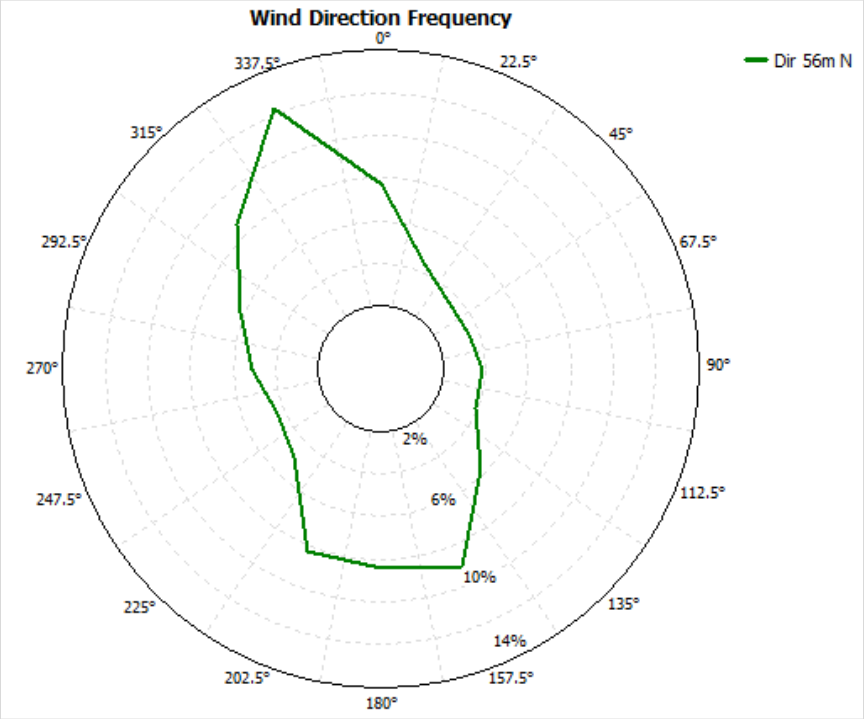

Figure 9-3 Elm Creek II Wind Rose

9.1.10 Other Meteorological Conditions

Other meteorological conditions of note for the Project Area include risks of low temperatures and icing events. The average temperature at the Project Area is 7.6 C (45.7 °F) with minimum and maximum temperatures of -25°C (-13°F) and 38°C (100°F). Each turbine will have a cold weather package to mitigate hazards associated with extreme temperatures. The package will shut down at temperatures below -30.0°C (-22°F) and temperatures above 40°C (104°F).

9.2 Location of Other Wind Turbines Within 10 Miles of Project Area

There are four wind farms within 10 miles of the Project Area (reference (91)). They are:

- Elm Creek I (66 turbines) in Jackson County
- Odell Wind Farm (100 turbines) in Jackson County
- Trimont Wind Farm (67 turbines) in Jackson County
- Odin Wind Farm (10 turbines) in Jackson County

10 Project Construction

Repowering will consist of the following general construction steps:

- Completing temporary turning radius improvements to existing gravel access roads and public road intersections to accommodate truck deliveries
- Preparing crane assembly areas
- Preparing laydown and staging areas
- Offloading new turbine components near operating turbines
- Installing adapter section at the top of each existing tower to be retrofitted
- Removing and replacing existing blades, hub, and the nacelle
- Installing new 34.5 kV collector lines and capacitors (as necessary)
- Performing engineering inspections on new components
- Returning turbines to operation
- Restoring temporarily disturbed areas to pre-construction conditions

Elm Creek II is coordinating with the construction contractor on disposal options either at a landfill or at a re-use or recycling facility for the blades. The remaining materials will be reduced to transportable size and removed from the site for recycling or disposal at a suitable facility. Waste diversion and recycling will be utilized, when available, through local facilities.

Elm Creek II will minimize temporary disturbance by using previously disturbed construction areas such as turbine pads, electrical collector line easements, and permanent access roads. Turbine pads and permanent access roads will be widened, as necessary, to facilitate equipment removal and installation. It is estimated that construction work areas at each turbine pad location would encompass an approximately 300-foot buffer that will be used to temporarily stage turbine blades, nose cone, and nacelle. Grading will not be required for the entire base area; however, this area will contain an engineered crane pad on which the main crane will be placed.

Elm Creek II is coordinating with vendors and the FAA regarding installation of an ADLS radar unit for the Project. Impacts associated with ADLS are described in Section 6.3.3. Elm Creek II anticipates impacts associated with ADLS will be similar to a MET tower, requiring a construction workspace of approximately 75 feet by 75 feet (less than 0.1 acre).

10.1 Roads and Infrastructure

Temporary roadway improvements may be necessary on some public roads within the Project Area. The contractor will use existing state, county, and township roads for the transportation of equipment,

construction materials and personnel for construction activities. Temporary roadway improvements along specific routes may also be necessary to facilitate the movement of equipment. There will be turning radii at various intersections to allow for turbine component deliveries.

Elm Creek II is currently coordinating with the applicable road authorities regarding the planned use of haul routes that may require road improvements or traffic control measures during the construction period and will obtain any overweight permits, road use permits, road maintenance agreements, and other approvals required. During construction, Elm Creek II will perform routine maintenance and roadway repairs associated with Project activities and in accordance with any Project specific road use agreements.

10.2 Access Roads

The Project will not require construction of new, permanent access roads. The access roads are approximately 4.9 m (16 ft) wide and use a low profile design to allow perpendicular crossings by farm equipment. Existing access roads provide access to the wind turbines year-round and may be temporarily widened to allow for crane movement and delivery of equipment to the construction area located at the base of each turbine.

Elm Creek II will coordinate with landowners throughout the repowering process to minimize disturbances to active agricultural lands. Crane movement and equipment delivery will require improvements to intersections and access roads to accommodate cranes and oversized hauling vehicles. These improvements will be temporary and generally consist of removing topsoil, compacting subsoil, and constructing a temporary compacted rock roadway.

Crane assembly areas will be sited adjacent to existing turbine access roads; the precise location of crane assembly areas will be finalized based on landowner requests, avoidance of environmental constraints such as wetlands and sensitive habitat, and other factors. Before a crane is moved to a turbine site, compacted rock crane pads and turbine construction areas will be prepared.

Access roads widened for crane travel and equipment deliveries will be reduced to their permanent width of approximately 4.9 m (16 ft) wide upon completion of construction. Where temporary improvements are removed, areas will be graded to natural contours, and soil decompaction and reseeding will occur as described further in Sections 8.11.1 and 8.15.1. After construction, temporary access road improvements and turbine working areas will be removed and disturbed areas will be restored to pre-construction conditions.

10.3 Crane Paths

Cross-country temporary crane paths will also be required for the Project. Crane paths are typically up to 50 feet wide. Generally, the large erection cranes use cross-field routes as opposed to the local road system. For dry or frozen conditions, no work may be necessary to prepare crane paths; however, in wet conditions or other such conditions that may pose soft soil conditions, Elm Creek II may use timber or steel matting through part or the entire course of the crane path, if needed.

Preliminary crane paths have been identified on Map 19. These crane paths will be further microsited to avoid sensitive resources and/or obtain necessary wetland and water crossing permits from the appropriate agencies. Final crane paths will be included in the site plan to be filed prior to construction.

10.4 Temporary Laydown Yard

Secure temporary laydown areas will be prepared for the storage of material and components and housing of construction trailers. The Project will require approximately two, up to 10-acre temporary laydown areas for staging construction equipment and materials as well as to house construction trailers and provide parking for construction vehicles and construction employees' personal vehicles. Map 19 has identified the preliminary location for one of the two potential laydown yards. Upon final negotiations with landowners, the laydown yards will be surveyed and sited to avoid impacts to sensitive resources such as undisturbed habitat and water resources. The final laydown yard locations will be included in the site plan to be filed prior to construction.

10.5 Post-Construction Cleanup and Site Restoration

Project activities causing temporary impacts are associated with the widening of existing access roads for equipment transport, turbine pad construction areas, turning radius improvements at access roads and public road intersections, laydown yards, crane paths and other turbine repowering activities within construction areas. Areas temporarily disturbed by construction activities will be re-graded to original contours and revegetated with native seed mixes, crops, or as otherwise noted in land use agreements. In areas where soil compaction occurs from construction activities, areas will be uncompacted, topped with topsoil, and revegetated. Impacted areas will be monitored to confirm revegetation. Stormwater BMPs, such as silt fence and straw wattle, will not be removed until at least 70 percent revegetation/regrowth has occurred, unless the area is in a tillable agricultural field. If the area is in tillable agricultural field, a cover crop will be planted to minimize soil loss if allowed by the landowner.

Temporary road radius improvements and temporary culverts may be removed and restored as turbines become mechanically complete. For any section of state, county, or township road used as a haul route, the roadway will be restored to its pre-construction state or as negotiated in road use agreements. This may consist of re-grading, re-paving, enhancing the shoulder of the road, or enhancing the segment of roadway as agreed upon by Elm Creek II and the responsible road authority.

10.6 Operation of Project

Elm Creek II will continue to be responsible for O&M of the Project. O&M will be conducted by Elm Creek II consistent with applicable North American Electric Reliability Corporation Reliability Standards. There is 24 hours per day, 7 days a week operational monitoring of the Facility through SCADA. An O&M crew is on-site during normal working hours to monitor turbine operation from the O&M facility and to conduct maintenance activities.

Major components of turbines will undergo routine maintenance according to the schedules established by the component manufacturer. Examples of routine maintenance activities include replacing lubrication filters, replacing gear oil, adding coolant, greasing components, and applying paints or coatings for

corrosion control. Over the operational life of the turbine, some mechanical components may also need repair or replacement. Other activities will include regrading and gravel replacement on access roads, routine electrical inspections, and noxious and invasive weeds management.

10.7 Costs

Elm Creek II estimates the costs to design and construct the repowered Project to be approximately $235 million. Based on the existing Facility costs, Elm Creek II estimates the annual operating and maintenance costs for the Project to be approximately $4.7 million, that includes staff, spare parts, and equipment.

10.8 Schedule

Pending receipt of all required approvals, Elm Creek II plans to begin construction of the Project as early as Q2 2026. Construction is anticipated to last between 6-12 months. The repower Project is anticipated to begin commercial operation as early as December 31, 2026.

10.9 Energy Projections

A net capacity factor of approximately 46 percent is expected annually for the Project. A projected average annual output of 556,368 MWh is anticipated, which is a 21 percent increase from current operations.

11 Decommissioning and Restoration

To address changes from the Project, Elm Creek II developed an updated Decommissioning Plan (Appendix O) that addresses the decommissioning of the Facility. The Decommissioning Plan includes the following components:

- Decommissioning objective
- Project description
- Proposed and future land use
- Notifications to landowners, agencies, and local officials
- Decommissioning tasks
- Decommissioning permits and approvals
- Decommissioning schedule
- Cost estimate
- Financial assurance

Decommissioning tasks will specifically include the removal/disposition of these features:

- Turbine towers
- Turbine generators
- Foundations to a depth of four feet below grade (with MPCA approval)
- Access roads
- Aboveground electrical collection lines
- Underground electrical collection lines buried less than 4 feet
- O&M building

12 Identification of Other Permits

Elm Creek II will be responsible for undertaking required environmental review and will obtain permits and licenses that are required following issuance of the Site Permit Amendment. Potential permits or approvals that have been identified as being required for the construction and operation of the Project are shown in Table 12-1.

Introductory agency letters were mailed in August 2023 to the USACE, Minnesota Department of Agriculture, DNR, Minnesota Department of Health, DOT, and MPCA requesting comments on the proposed repower Project. Additional introductory letters were mailed to the SHPO, OSA, Minnesota Indian Affairs Council, the 11 federally recognized tribes in Minnesota, and county/township agencies requesting comments on the proposed repower Project in September 2023. Elm Creek II meet with the DOC-EERA staff in September 2023 and September 2024 to discuss the repower project and anticipated schedules. Responses from applicable agencies have been incorporated into this Application, where appropriate, and summarized in Appendix J. Copies of agency correspondence are also provided in Appendix J.

Table 12-1 Potential Permits and Approvals

Regulatory Authority	Permit/Authorization	Status
TRIBAL		
PUC consultation with Minnesota Tribal Nations	Minnesota Statute 10.65	Initiated on behalf of PUC, Elm Creek II provided project introductory letters
FEDERAL		
USACE - St. Paul District	Section 404 Clean Water Act (CWA) permit	Pending submittal if necessary, based on Project impacts
USFWS	USFWS coordination under Section 7 or Section 10 of the Endangered Species Act	Pending if necessary, based on Project impacts

Regulatory Authority	Permit/Authorization	Status
FAA	Determination of No Hazard to Air Navigation (Form 7460-1 Notice of Proposed Construction or Alteration)	Completed for existing turbines (Appendix D) Pending for ADLS system
FAA	Notice of Actual Construction or Alteration (Form 7460-2)	Pending
Federal Communications Commission	Antenna Structure Registration	Pending
STATE		
Minnesota Public Utilities Commission (PUC)	Site Permit Amendment for Large Wind Energy Conversion System (LWECS)	Submitted
Minnesota Pollution Control Agency (MPCA)	Section 401 Water Quality Certification (WQC)	Concurrent with Section 404 CWA process, Minnesota conditions will be met
MPCA	General Permit MNR 100001 Construction Stormwater Discharge	Pending development of SWPPP and submittal of Notice of Intent
DNR Division of Water Resources	License to Cross State Lands or Public Waters	Pending submittal if necessary, based on Project impacts
DNR Division of Water Resources	General Permit 1997-0005 for Temporary Water Appropriations	Pending submittal if necessary, based on Project impacts
DNR Division of Water Resources	Public Waters Work Permit	Considered but not anticipated to be required
Minnesota State Historic Preservation Office (SHPO)	Coordination regarding the identification of Cultural and Historical Resources to support the LWECS permitting process	SHPO's response to Elm Creek II is provided in Appendix J. Elm Creek II submitted a literature review indicating areas previously surveyed. If additional areas are subject to ground disturbance that were not previously surveyed, additional consultation may apply.
Minnesota Department of Transportation (DOT)	Right of Way permits and access driveway permits for DOT roads; oversize/overweight permit for state highways	If heavy equipment use will occur on DOT roads, the contractor will obtain permits as necessary.
LOCAL		
Jackson and Martin Counties	Miscellaneous work permits	Elm Creek II will obtain local permits as necessary.
Jackson and Martin Counties	Oversize weight permit	If heavy equipment use occurs on county roads, the contractor will obtain permits as necessary.

Regulatory Authority	Permit/Authorization	Status
Jackson County Soil and Water Conservation District (SWCD) and Martin County SWCD	Wetland Conservation Act (WCA) Exemption	Elm Creek II anticipates that wetlands regulated under WCA will be exempt under the no-loss exemption. If impacts not meeting the no loss exemption apply, an application will be submitted as required.
Townships	Miscellaneous work permits, right-of-way permits, crossing permits, driveway permits for access, oversize/overweight permits for township roads.	Elm Creek II will obtain local permits as necessary.

13 References

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