Final Environmental Assessment for the Issuance of an Eagle Take Permit for the Grand Meadow and Pleasant Valley Wind Farms

Prepared by

U.S. Fish and Wildlife Service

Twin Cities Field Office

U.S. Department of the Interior

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List of Acronyms and Abbreviations

Applicant	Northern States Power Company – Minnesota, doing business as Xcel Energy
BBCS	Bird and Bat Conservation Strategy
CFR	Code of Federal Regulations
CRM	United States Fish and Wildlife Service Bayesian Collision Risk Model
EA	Environmental Assessment
ECP	Eagle Conservation Plan
ECP Guidance	*Eagle Conservation Plan Guidance Module 1: Land-based Wind Energy, Version 2*
Eagle Act	Bald and Golden Eagle Protection Act
EMU	Eagle Management Unit
ETP	Eagle Take Permit
GMWF	Grand Meadow Wind Farm
LAP	Local Area Population
NEPA	National Environmental Policy Act
O&M	operations and maintenance
PEIS	Programmatic Environmental Impact Statement
Project	Grand Meadow and Pleasant Valley Project (collectively)
PVWF	Pleasant Valley Wind Farm
Service	United States Fish and Wildlife Service
USC	United States Code

Chapter 1: Introduction

This Environmental Assessment (EA) has been prepared to analyze the environmental consequences of the U.S. Fish and Wildlife Service (Service) issuing an incidental take permit for the take of bald eagles associated with the operation of the Grand Meadow Wind Farm (GMWF) and Pleasant Valley Wind Farm (PVWF) (Project), pursuant to the National Environmental Policy Act (NEPA) (42 United States Code [USC] §§ 4321–4347). The two wind farms are being considered a single project in terms of permit issuance because they are adjacent to one another and owned by the same entity. Issuance of an eagle incidental take permit (permit) by the Service for take that is incidental to otherwise lawful activities under the Bald and Golden Eagle Protection Act (Eagle Act) (16 USC §§ 668–668d and 50 Code of Federal Regulations [CFR] § 22.26) constitutes a discretionary Federal action that is subject to NEPA. This EA assists the Service in ensuring compliance with NEPA, and in making a determination as to whether any "significant" impacts could result from the analyzed actions that would require preparation of an Environmental Impact Statement. This EA evaluates the effects of alternative actions for our decision whether to issue an eagle incidental take permit.

The Eagle Act authorizes the Service to issue eagle take permits (ETPs) only when the take is compatible with the preservation of each eagle species, defined (in Service 2016a) as "consistent with the goals of maintaining stable or increasing breeding populations in all eagle management units (EMUs) and the persistence of local populations throughout the geographic range of each species."

The Applicant, Northern States Power Company – Minnesota dba Xcel Energy, is requesting Eagle Act take coverage for operational activities associated with the Project. The Applicant has requested a 5-year ETP for non-purposeful take of bald eagles (*Haliaeetus leucocephalus*) for the Project under the Eagle Act. The Applicant's Eagle Conservation Plan (ECP; Attachment A) is the foundation of the permit application for the Project.

The Applicant is requesting a permit for the take of 6 bald eagles over a 5-year permit tenure. The Project is anticipated to have a 30-year lifespan. This EA evaluates whether issuance of the eagle incidental take permit will have significant impacts on the existing human environment. "Significance" under NEPA is defined by regulation at 40 CFR 1508.27, and requires short- and long-term consideration of both the context of a proposal and its intensity.

The Applicant has requested this permit application be processed (grandfathered) under the 2009 Eagle Rule (81 FR 91494). Except where noted, this proposal conforms with, and carries out, the management approach analyzed in, and adopted subsequent to, the Service's Programmatic Environmental Impact Statement (PEIS) for the Eagle Rule Revision, December 2016 (Service 2016a). Accordingly, this EA tiers from the 2016 PEIS. Project-specific information not considered in the PEIS (Service 2016a) will be considered in this EA as described below.

1.1 Purpose and Need

The need for this action is a decision on a 5-year eagle incidental take permit application received from the Applicant. The decision must comply with all applicable regulatory requirements and be compatible with the preservation of eagles.

1.2 Authorities

Service authorities are codified under multiple statutes that address management and conservation of natural resources from many perspectives, including, but not limited to the effects of land, water, and energy development on fish, wildlife, plants, and their habitats. This analysis is based on the Eagle Act (16 USC 668-668d) and its regulations (50 CFR Part 22). The PEIS (Service 2016a) has a full list of authorities that apply to this action (PEIS Section 1.6, pages 7-12), which are incorporated by reference here.

1.3 Background

The Applicant is currently operating and maintaining both wind facilities, which are located approximately 10 miles east-northeast of Austin in Dodge and Mower counties, Minnesota (Figure 1). GMWF has a capacity of 100.5 megawatts and PVWF has a capacity of 200 megawatts. The GMWF includes 67, 1.5 MW GE SLE turbines with a rotor diameter of 77m. The PVWF includes 100, 2.0 MW Vestas V100 turbines with a rotor diameter of 100m. The GMWF footprint (turbines and a 1-kilometer buffer) contains approximately 13,080 acres of land, while the PVWF footprint contains approximately 31,175 acres of land (Figures 2a and 2b). The Project footprints are located adjacent to one another, with Interstate 90 running between the two facilities. Additional facility details for the Project are provided in Attachment A, Section 3.0 of the Project's ECP.

A suite of pre-construction surveys were conducted at PVWF, and post-construction surveys were conducted at both PVWF and GMWF. Further discussion on those surveys is provided in Section 3.1. Eagle use surveys began in 2007 and continued through 2017, during which time conservation measures such as turbine curtailment, nest removal, and eagle depredation management were completed, and an operational monitoring plan was developed (Attachment A, Section 10.0). As part of the construction and operation of the Project, the Applicant has employed best management practices, as included in the ECP (Attachment A, Section 8.0), to reduce risk to eagles and decrease the potential for eagle fatalities.

1.4 Scoping, Consultation, and Coordination

This EA incorporates by reference the scoping performed for the PEIS (Chapter 6, page 175). The Applicant worked closely with the Service and other Federal and state agencies, including the Minnesota Department of Natural Resources (MDNR; state environmental review and permitting), the Mower County Soil and Water Conservation District, the Minnesota Public Utility Commission (Large Wind Energy Conversion System [LWECS] Site Permit), and the Minnesota Department of Commerce (environmental review for LWECS Site Permit) to develop the ECP in support of its application to avoid, minimize, and mitigate adverse effects on eagles.

Development of the Project, including consultation, coordination, and scoping, was initiated in 2007 (GMWF) and 2008 (PVWF). Both Projects were originally proposed and developed by other entities and were purchased by the Applicant in 2008 (GMWF) and 2015 (PVWF). For the purposes of this EA, "the Applicant" will be used to refer to the party through which all coordination and communication activities have occurred with the Service. A summary of coordination with agencies from 2007 to 2017 is provided in Table 1 of the ECP (Attachment A).

Public Comment: The Service published the Draft EA on the Midwest Region's Eagle Permit website on December 13, 2019, opening a 30-day comment period.

Updates to the Final EA: A number of revisions have been made to the Final EA from the draft version. The more substantive changes include: an update to the federally listed species described in the Section 7 consultation (Section 1.4.2), a summary of collision risk modeling for golden eagles (Section 3.2), and an update to other permitted take to include the MidAmerican Wind Project's take numbers (Section 4.2.1.4).

1.4.1 Tribal Coordination

The Service coordinated with potentially affected tribal entities within a 100-mile radius of the Project boundary. Each tribe was notified of the Proposed Action and the availability of this EA and requested to provide comments.

Consultation letters were sent to seven tribal entities in April 2018, informing potentially affected tribes of the receipt of the permit application and the intent to prepare an Environmental Assessment for the proposed permit issuance. These initial letters were sent out to the Lower Sioux Indian Community, Prairie Island Indian Community, Upper Sioux Community of Minnesota, Flandreau Santee Sioux Tribe, Santee Sioux Nation, Sisseton-Wahpeton Oyate, and Spirit Lake Tribe. The scope of this notification was determined from the Department of Housing and Urban Development's Tribal Directory Assessment Tool[1]. No comments were received from this notification.

Prior to the notice of the public comment and the publication of the Draft EA and applicant's ECP (December 2019), we sent letters out to the Prairie Island Indian Community, the Ho-Chunk Nation, and the Shakopee Mdewakanton Sioux Community. The scope of tribal notification was changed based on tribal interests within 100 miles of the project footprint rather than the Housing and Urban Development's database.

The Service received one comment from a tribal entity, requesting additional information on permitted and unpermitted eagle take at wind farms, as well as an update on the low-risk eagle permitting framework. The Service responded, citing the number of eagle take permits that have been issued to date at wind facilities, and the latest published number of eagles killed at wind farms. The Service

[1] https://egis.hud.gov/tdat/, Accessed October 24, 2017

outlined the status and planned publication for comment of the proposed low-risk framework permit, and the Service's plan to update additional information on eagle fatalities at wind farms.

1.4.2 Endangered Species Act Consultation

Northern long-eared bat (*Myotis septentrionalis*), a federally threatened species; and prairie bush clover (*Lespedeza leptostachya*), a federally threatened species, have the potential to occur in Dodge and Mower counties, Minnesota. The Service completed an intra-agency Section 7 consultation under the Endangered Species Act (see Section 3.3). Previous versions of this document had also identified dwarf trout lily (*Erythronium propullans*), a federally endangered species; as potentially occurring in Dodge and Mower counties. However, this species is not currently known to occur in Dodge or Mower counties (ECOS 2020), so is not discussed further in this document.

1.4.3 Scope of Environmental Assessment

This EA considers the Proposed Action and the No Action Alternative related to the Applicant's application for an ETP to authorize the incidental take of bald eagles resulting from operation of the Project. The proposed federal action includes the issuance of an ETP, and as such, it is not within the EA's scope to evaluate impacts associated with the siting and construction of the Project. It analyzes the effects of Service's proposed issuance of a 5-year programmatic ETP on the human environment and evaluates impacts over the 30-year life of the Project. In addition, the EA discusses the environmental impacts that will occur whether or not the Service issues an ETP.

Chapter 2: Proposed Action and Alternatives

2.1 Proposed Action

Issuance: We propose to issue a 5-year permit to take up to 6 bald eagles with associated conditions, as allowed by regulation.

The Project would operate 167 turbines for 30 years and would implement the Conservation Measures outlined in the ECP (Attachment A, Section 10.4). The 5-year permit duration was a limitation of the previous iteration of the ETP regulations (adopted in 2009) as defined in 50 CFR §13 and §22. Under the updated rule released by the Service on December 16, 2016, the maximum permit duration has been extended from 5 years to 30 years. However, Applicants that submitted permit applications before July 14, 2017 (as did this Applicant), may choose to be reviewed for coverage under the 2009 regulations. This Applicant has chosen to be reviewed pursuant to the 2009 regulations. The Applicant has indicated they may apply for a 25-year permit at year 5, when this current permit expires. This subsequent permit would be processed under the 2016 Eagle Regulations.

Conditions: The Applicant will implement all measures required by other agencies and jurisdictions to conduct the activity at this site which includes the development and implementation of a Bird and Bat

Conservation Strategy (BBCS) at PVWF. Applicant-committed measures, such as the development and implementation of a BBCS at GMWF, adaptive management (Attachment A, Section 10.0), post-construction mortality monitoring (Attachment A, Sections 10.2, 10.3, 11.0), and the conservation commitments described in the Applicant's ECP (see Section 4.4; see also Attachment A, Section 10.0).

Avoidance and Minimization Measures: A complete description of the avoidance and minimization measures (AMMs) can be found in the Applicant's ECP, Attachment A, Section 10.1 (Best Management Practices) and Section 10.4 (Adaptive Management). A summary of these measures can be found in the "Environmental Consequences" section below.

Mitigation: Because the Project would not be permitted for a take limit above the Mississippi Flyway EMU threshold or greater than 5 percent of the local area population (LAP), compensatory mitigation would not be required by the Service.

Monitoring and Adaptive Management: All monitoring and adaptive management to be implemented by the Applicant are discussed in the Applicant's ECP.

2.2 Alternative 1: No Action

Under the No Action Alternative, we would take no further action on the Applicant's permit application. In reality, the Service must take action on the permit application, determining whether to deny or issue the permit. We consider this alternative because Service policy requires evaluation of a No Action Alternative and it provides a clear comparison of any potential effects to the human environment from the Proposed Action.

The No Action Alternative in this context analyzes predictable outcomes of the Service not issuing a permit. Under the No Action Alternative, the Project would likely continue to operate without an ETP being issued. Thus, for purposes of analyzing the No Action Alternative, we assume that the Applicant will implement all measures required by other agencies and jurisdictions to conduct the activity at this site, but the conservation measures proposed in the eagle incidental take permit application package would not be required. The Applicant may choose to implement some, none, or all of those conservation measures. Under this alternative, we assume that the Applicant will take some reasonable steps to avoid taking eagles, but the Applicant will not be protected from enforcement for violating the Eagle Act should take of an eagle occur.

2.3 Other Alternatives Considered but Not Evaluated in this Environmental Assessment

The Service considered additional alternatives based on communication with the Applicant but concluded that these alternatives did not meet the purpose and need underlying the action because it is impracticable for the Applicant to carry out. Therefore, the Service did not assess the potential environmental impacts of those alternatives. Below is a summary of the alternatives considered but eliminated from further review.

At the time of this EA, the Project is operational so many alternative actions that might be appropriate to consider for facilities that have not been constructed are not appropriate for this analysis. Alternative actions that were considered but not evaluated in this analysis include requesting a 30-year permit as opposed to a 5-year permit or requesting a higher or lower number of eagles potentially taken. The 30-year permit would not have a substantive change on this analysis and would require consultation with the Service as to status of eagles taken at the 5-year mark. Likewise, the amount of take requested would not have a substantive impact on this analysis.

2.3.1 Deny Permit Alternative

Under this alternative, the Service would deny the permit application because the Applicant falls under one of the disqualifying factors and circumstances denoted in 50 CFR 13.21, the application fails to meet all regulatory permit issuance criteria and required determinations listed in 50 CFR 22.26.

Our permit issuance regulations at 50 CFR 13.21(b) set forth a variety of circumstances that disqualify an applicant from obtaining a permit. None of the disqualifying factors or circumstances denoted in 50 CFR 13.21 apply to the Applicant. We next considered whether the Applicant meets all issuance criteria for the type of permit being issued. For eagle incidental take permits, those issuance criteria are found in § 22.26(f). The Applicant's application meets all the regulatory issuance criteria and required determinations (50 CFR 22.26) for ETPs (Attachment A).

When an applicant for an eagle incidental take permit is not disqualified under 50 CFR 13.21 and meets all the issuance criteria of 50 CFR 22.26, denial of the permit is not a reasonable option. Therefore, this alternative action—denial of the permit—was eliminated from further consideration.

Chapter 3: Affected Environment

3.1 Bald Eagle

3.1.1 Bald Eagles in Minnesota

Bald eagles in Minnesota are concentrated within the forested areas within the northern half of the state as well as along the St. Croix and Lower Mississippi rivers (MDNR 2018). Due to recovery efforts, the bald eagle also has begun to reoccupy much of its former range throughout southern Minnesota in recent years, as is evidenced by a 2005 nest survey which identified 872 active bald eagle nests throughout the state (MDNR 2006). In the lower 48 states, Minnesota and Florida host the largest populations of breeding bald eagles (Service 2019).

3.1.2 Bald Eagle Distribution in the Project Vicinity

Habitat within and surrounding the Project is dominated by agricultural land used for row crop production along with developed land (farmsteads), forested windbreaks around farmsteads, and small

tracts of grasslands. Prey resources may be available for wintering or migrating eagles in the spring and fall in the forms of fish in water bodies that have thawed, waterfowl using flooded fields, or small mammals and carrion; however, no known concentrated prey resources exist that would draw wintering or migrating eagles into the Project.

3.1.3 Project-Specific Use and Distribution

3.1.3.1 Pre-Construction

The pre-construction avian point count surveys, aerial raptor nest surveys, and ground-based raptor surveys completed for PVWF are summarized in Table 1. Additional details for these surveys are provided in Attachment A, Section 5.0. GMWF was developed, permitted, and constructed prior to the USWFS issuance of the Wind Energy Guidelines and *Eagle Conservation Plan Guidance Module 1: Land-based Wind Energy, Version 2* (ECP Guidance). Pre-construction wildlife surveys were not completed for GMWF. As identified in Table 1, data from pre-construction avian use surveys at PVWF were used for the Service's Collision Risk Model (CRM) model, which is the basis for the take estimation included in this permit application. The Service recognizes that the avian point counts from which the model was derived may not be representative of the eagle use within the Project footprint. The point counts were only conducted for 1 year and for 20 minutes at a time (concurrent with songbird surveys) rather than the currently recommended eagle-only 60 minutes. The survey effort was not consistent across seasons, with the time of higher eagle observations occurring during the lowest level of survey effort. Due to these reasons, the estimation of eagle risk may be underrepresented. However, the Service uses the conservative take estimate from the 80th quantile of the model to bolster against underestimation of risk. Additionally, monitoring, yearly check-ins, adaptive management, and updating the model with post-permit issuance monitoring will better refine eagle risk within a reasonable timeframe.

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Table 1. Summary of Avian and Raptor Surveys Completed at Each Project

Year	Season	Type of Survey	Survey Length	Survey Locations	Surveys Performed	Survey Area or Total Time	Comments	Included in United States Fish and Wildlife Bayesian Collision Risk Model?
PVWF (Pre-Construction and Post-Construction)								
2009-2010	Fall-Summer	Avian Point Count	20 minutes	15	34	7,800 minutes	Four bald eagles observed	Yes
2013	Spring (March)	Aerial Raptor and Eagle Nest	1 day	Area within a 2-mile buffer of Project boundary	1	540 minutes	Three in use bald eagle nests identified outside Project boundary, but within 2-mile buffer of boundary	No
2014	Spring (April)	Ground-based Raptor Nest	1 day	Public roadways located throughout Project boundary and within 2-mile buffer of boundary	1	600 minutes	One in use bald eagle nest identified outside of Project boundary, but within 1-mile buffer of boundary	No
2016–2017	March 2016–February 2017	Eagle Use	60 minutes	19 plot locations distributed throughout the 1-kilometer buffer around turbines (30% coverage of footprint)	12	800-meter radius circular plot locations; 60 minutes at each survey location for a total of 13,680 minutes/228 hours	12 bald eagles observed; 24 eagle use minutes recorded	No
2016	March 2016–September 2016	Ground-based Eagle Nest Monitoring	4 hours	One (Nest 2016–01)	28	4 hours weekly for 28 weeks for a total of 6,720 minutes/122 hours	Nest 2016–01 identified within Project footprint on March 10, 2016; weekly surveys observed one eaglet on April 21, 2016, which fledged the nest in June 2016; no activity observed on the nest after August 2, 2016	No
2016	Spring (April 7–9, 2016)	Aerial Eagle Nest	15 hours	Area within 10-mile buffer from Project footprint of both Project	1	15 hours of flight time over 3 days	One in use bald eagle nest (Nest 2016-01) within the Project footprint. Seven in use bald eagle nests (Nests 2016-02, 2016-03, 2016-04, 2016-05, 2016-06, 2016-07, 2016-08) were identified outside the Project footprints but within the 10-mile buffers. Two alternate bald eagle nests (Nests 2016-09 and 2016-10) were identified outside of the Project footprints but within the 10-mile buffer (see Table 2)	No
2016–2017	May 16, 2016–May 11, 2017 (all seasons)	Standardized Carcass Searches	NA	100 turbine locations	35	160-meter square plots at 5 turbines, plus road and pad at 95 turbines	No dead or injured bald eagles observed	No
2016	June 8, 2016	Ground-based Eagle Nest Observations	1 day	Eagle Nests 2016–01 and 2016–02 located within 2 miles of Project turbines	1	4-hour observation of each nest from nearest public right-of-way	Nest 2016–01 and 2016–02 were observed to be in use	No
GMWF (Post-Construction)								
2013–2014	July–October 2013 and July–October 2014	Standardized Carcass Searches[1]	5 days	Full plot surveys at 13 turbine locations; roads and pads at all other turbine locations	30	120-meter square plots at 13 turbines, plus roads and pads at remaining turbines	No dead or injured bald eagles observed	No
2016–2017	March 2016–February 2017	Eagle Use	60 minutes	Eight plot locations distributed throughout the 1-kilometer buffer around turbines (30% coverage of footprint)	12	800-meter radius circular plot locations; 60 minutes at each survey location for a total of 5,760 minutes/96 hours	Four bald eagles observed; 16 eagle use minutes recorded	No
2016	Spring (April 7–9, 2016)	Aerial Eagle Nest	15 hours	Area within 10-mile buffer from Project footprint of both Projects	1	15 hours of flight time over 3 days	Five in use bald eagle nests (Nests 2016–03, 2016–05, 2016–06, 2016–07, and 2016–11), and two alternate bald eagle nests (Nests 2016–09 and 2016–10) outside Project footprint, but within 10-mile buffer	No

Sources: Pleasant Valley Wind, LLC 2014; Tetra Tech, Inc. 2017; WEST 2014a.

1. This survey was focused on identification of bat fatalities; avian fatalities were noted as incidental observations.

2. Nests are described as in use or alternate consistent with current guidance. The ECP uses older terms of occupied/unoccupied and active/inactive.

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3.1.3.2 Post Construction

Post-construction eagle use surveys, aerial and ground-based eagle nest surveys, ground-based eagle nest monitoring, and standardized carcass monitoring (focused on both birds and bats) were conducted at PVWF in 2016[2] and 2017[3] (Table 1). Post-construction eagle use surveys and aerial eagle nest surveys were conducted at GMWF in 2016 and 2017. The Applicant elected to conduct post-construction eagle use surveys at the Project in order to further evaluate eagle use during operation of the facilities; the eagle minutes recorded during these surveys were not used in the CRM (Table 1). Additional details for these surveys are provided in Attachment A, Section 8.0.

3.1.3.3 Aerial Nest Surveys

Table 2 provides a summary of the results of the aerial eagle nest surveys at the Project that were completed post-construction, in April 2016. These were done in response to discovery of a nest during the construction of PVWF and concerns that other nests may have been built since pre-construction surveys were completed. Additionally, as GMWF hadn't previously been surveyed for nests, the surveys provided an evaluation of the Project as a whole. The survey team located one in use bald eagle nest (Nest 2016-01) within the Project footprint. Eight in use bald eagle nests (Nests 2016-02, 2016-03, 2016 04, 2016-05, 2016-06, 2016-07, 2016-08, and 2016-11) were identified outside the Project footprint but were located within the 10-mile buffers (Figure 3). Two alternate (referenced in the ECP and figures as occupied, inactive) bald eagle nests (Nests 2016-09 and 2016-10) were identified outside of the Project footprint but within the 10-mile buffers (Figures 3 and 4).

Table 2. Summary of 2016 Bald Eagle Nest Survey Data for the Project, Minnesota

Nest	Distance from Project's Nearest Turbine (miles)	Adult Present?	Number of Eggs or Young	Nest Status	Condition	Comments
2016–01	0.080	Yes	1 chick[1]	In-use	Excellent	Adult sitting on nest
2016–02	0.627	Yes	2 chicks[1]	In-use	Excellent	Adult sitting on nest
2016–03	3.028	Yes	Unknown	In-use	Excellent	Adult sitting on nest
2016–04	5.715	Yes	Unknown	In-use	Excellent	Adult female sitting on nest; adult male perched nearby
2016–05	9.083	Yes	Unknown	In-use	Excellent	Adult sitting on nest
2016–06	3.785	Yes	Unknown	In-use	Excellent	Adult sitting on nest
2016–07	6.788	Yes	Unknown	In-use	Excellent	Adult sitting on nest

[2] 2016-2017 Post-Construction Mortality Monitoring Annual Report. Pleasant Valley Wind Farm. Mower and Dodge counties, Minnesota. https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7b20D7F65D-0000-CB18-B1D9-4BA60721047B%7d&documentTitle=20178-134856-01

[3] This document is not yet available, but can be found at the following website when available: https://www.edockets.state.mn.us/EFiling/edockets

Nest	Distance from Project's Nearest Turbine (miles)	Adult Present?	Number of Eggs or Young	Nest Status	Condition	Comments
2016–08	9.132	Yes	2 chicks[1]	In-use	Excellent	Adult perched on nest; other adult perched in tree nearby; chicks appear to be about 1 week old
2016–09	5.529	No	Unknown	Alternate	Good	Nest had a fresh lining in it
2016–10	5.660	No	Unknown	Alternate	Good	Nest had a fresh lining; two adults seen flying nearby
2016–11	7.468	Yes	Unknown	In-use	Excellent	Adult sitting on nest
1. No eggs or chicks were observed during the April 2016 aerial survey; however, chicks were observed during ground-based nest surveys completed for the Project on June 8, 2016.						

3.1.4 Bald Eagle Mortality Associated with Human Development

General threats to bald eagles are described in detail in the PEIS (Service 2016a). In Minnesota, bald eagle fatalities from vehicle collisions have become more frequent as populations have increased, due to their habit of feeding on deer carcasses along roadways (MDNR 2018). Lead poisoning is a major stressor of bald eagles in this region and contributes to vehicle collisions as well (Franson and Russell 2014). Stressors to local area populations of bald eagles are discussed in the Cumulative Effects Analysis in Section 4.3.

3.1.5 Bald Eagle Mortality Associated with Wind Energy Development

The risk of eagle collision at the Project is associated with the operational wind turbines, and potential collision with other Project facilities such as substations and overhead transmission lines, as well as vehicular traffic occurring at the Project.

Pagel et. al (2013) published a report of six substantiated bald eagle fatalities or injuries at wind energy facilities within the U.S. The Service is aware of more bald eagle deaths at wind farms than this and other cited reports, but details of these fatalities are not yet publicly available due to ongoing investigations. The Service intends to undertake a comprehensive review of bald eagle deaths at windfarms and will provide the findings when available.

The Service also is aware of arguments that the Service's wind collision probability model predicts high rates of bald eagle (*Haliaeetus leucocephalus*) fatalities at wind facilities given the low number that have actually been reported. The Service does not disagree that bald eagles may prove to be less at risk from blade-strike mortality than golden eagles, but the data available to the Service are not sufficient to conclude that. Reasons are:

- The Service has yet to be provided with strong pre- and post-construction bald eagle use and fatality data from any wind project where there is high bald eagle use;
- Bald eagles congregate in larger numbers than golden eagles, and while in those concentrations they engage in social behaviors that may increase their risk to blade strikes at a project sited in such an area;
- In some of the areas where bald eagles congregate, there are multiple fatalities each year of bald eagles that fly into static power distribution lines and vehicles, suggesting that as a species they do not possess a superior ability to avoid collisions; and
- There is a thorough study in Norway that documents a substantial population-level negative effect of a wind facility there on a population of the closely related white-tailed eagle (*Haliaeetus albicilla*) as a result of blade-strike mortality. For all of these reasons, the Service believes it is reasonable and prudent to consider bald eagles to be equally vulnerable to blade-strike mortality as golden eagles until data become available to estimate a specific collision probability for bald eagles.

The numbers of bald eagles across the nation and in Minnesota have been steadily increasing and are expected to continue to increase (MSNR 2018, Service 2016a).

Project-Specific Fatalities

On May 29, 2018 a dead, adult bald eagle was discovered on the ground, approximately 25 meters to the east of an active bald eagle nest (2017-1). The discovery was made while preparing to band the single eaglet present in the nest by a team which included staff from Xcel, Tetra Tech, and the Service. The remains were recovered and turned over to Service Law Enforcement by Mags Rheude, Service Biologist. Subsequently, the Service conducted a necropsy which determined that the dead bald eagle was a female and had "extensive internal hemorrhaging and fracturing, consistent with a strike by a wind turbine". The Service necropsy also revealed that "… the eagle had high levels of an anticoagulant from a rodenticide, which likely contributed to its death". It is not known if the dead eagle was part of the pair that nested at 2017-1.

Eagle nest 2017-1 is located in a tree line approximately 120 meters to the south of Turbine 17. Construction of this nest began in November 2017 and the nest was active in 2018 producing one chick. In 2016 a different bald eagle nest (2016-1) was located in the same tree line as 2017-1 and produced one chick. Nest 2016-1 was removed, under permit, in December 2016. The original nest and five subsequent nesting attempts were removed; however, the landowner ultimately refused further nest removal attempts and the nest was rebuilt and occupied in the 2018 breeding season.

3.2 Golden Eagle

Golden eagles do not breed in Minnesota, but they are known to migrate through Minnesota, with fall migration counts of between 115–200 eagles observed from the Hawk Ridge Bird Observatory located in Duluth, Minnesota (National Eagle Center 2017). There also are occasional reports of golden eagles in

the spring, fall, and winter in most counties of Minnesota. The primary migration corridors used by eagles include the major rivers, including the Mississippi, Minnesota, and Saint Croix rivers; and areas along the Saint Louis River and the Lake Superior shoreline (Service 2016b). In the United States, golden eagles are most numerous in winter in the Rocky Mountain states, Great Basin, and western edge of the Great Plains (Root 1988). Golden eagles use open country with sufficient prey base (GBBO 2010). An online database of bird observations reported four golden eagle sightings within 3 miles of the Project since March 2016 (eBird 2018).

An incidental observation of a single golden eagle was documented in 2010 during spring migration at PVWF. This observation occurred outside of the formal survey area for avian use surveys, and the observation was made outside of the turbine area (WEST 2010). No other golden eagle observations were made at the Project during other raptor or avian surveys, aerial eagle nest surveys, or post-construction surveys, including fatality monitoring.

As noted above, habitat within and surrounding the Project is dominated by agricultural land used for row crop production along with developed land (farmsteads), forested windbreaks around farmsteads, and small tracts of grasslands. Prey resources may be available for migrating golden eagles in the spring and fall in the forms of small mammals and carrion; however, no known concentrated prey resources exist that would draw wintering or migrating golden eagles into the Project. Major causes of golden eagle mortality include starvation (largely restricted to eagles in their first year), illegal poisoning, illegal shooting, intra-specific fighting, collisions with power distribution lines, vehicles, and wind turbines; and electrocution (Service 2016c). Given the low (and seasonal) occurrence of golden eagles in Minnesota, and that only a single golden eagle was detected incidentally during Project surveys, the current likelihood of take of this species appears to be very low. The applicant did not seek coverage for golden eagles based on the low presumed risk of take. Based on the regional and site-specific records, we agree the risk of golden eagle take is likely low. We ran the Service's Collision Risk Model for golden eagles based on presumed seasonal use of the Project site and using non-site specific data, assuming golden eagles were only present on site (and therefore only at risk) from October-April. The model estimated a take of less than one golden eagle over the 5-year permit duration (80% CI = 0.75/year).

3.3 Species Listed under the Endangered Species Act

Northern long-eared bat (*Myotis septentrionalis*), a federally threatened species; and prairie bush clover (*Lespedeza leptostachya*), a federally threatened species; have the potential to occur in Dodge and Mower counties, Minnesota. The Service conducted an intra-agency Section 7 consultation under the Endangered Species Act (Attachment B). Northern long-eared bats hibernate in caves and abandoned mines, usually from mid-October to March or April. The closest known hibernation site is Mystery Cave. This hibernation site is near Preston, Minnesota, 26 miles from the southern boundary of the Project Area. Acoustic surveys for bats were conducted in 2010 and 2011. High frequency calls consistent with eastern red bat, tricolored bat, little brown bat, or northern long-eared bats were recorded during these surveys (Pleasant Valley Wind, LLC 2014). Northern long-eared bats are difficult to confirm acoustically.

However, no northern long-eared bats were identified during standardized carcass searches at the operating Project.

No prairie bush clover were identified within the footprint of the Project. Species-specific surveys were not conducted for these plants because suitable habitats were not present in the Project footprint. No pre-construction studies within prairie habitat were completed due to lack of habitat present within the Project footprint.

3.4 Federally Listed Species Not Addressed

The Service has addressed impacts of the Proposed Action on all federally listed species known to, or have potential to occur within the Project area. Should new information become available that shows the likelihood of additional listed species in the Project area, or the status of a species changes, the Service will assess whether these changes warrant additional Section 7 analysis.

3.4.1 Migratory Birds

Pre-construction avian use surveys conducted at PVWF from September 18, 2009 through October 28, 2010 documented 56 bird species. Red-tailed hawk (*Buteo jamaicensis*) and American kestrel (*Falco sparverius*) were the most common of the five raptor species observed. Thirty-nine passerine (songbirds) species were observed during these surveys, and their occurrence was highest during the fall. Lapland longspur (*Calcarius lapponicus*) and red-winged blackbird (*Agelaius phoeniceus*) were the most abundant passerine species observed (Pleasant Valley Wind, LLC 2014). Besides bald and golden eagles, no federally listed bird species were observed during pre-construction avian use surveys completed at PVWF. No pre-construction surveys were conducted at GMWF.

3.5 Cultural and Socio-economic Interests

There are no cultural and socioeconomic interests that may be affected by issuance of the permit and the associated conservation and mitigation measures.

3.6 Climate Change

Climate change was considered in the PEIS (Service 2016a; Section 3.9, page 144) and is incorporated by reference here.

Chapter 4: Environmental Consequences

This section summarizes the effects on the environment of implementing the Proposed Action or No Action Alternative. The discussion of overall effects of the eagle incidental take permit program is provided in the PEIS (Service 2016a) and is incorporated by reference here. This section of this EA analyzes only the effects that were not analyzed in the PEIS that may result from the issuance of an eagle incidental take permit for this specific Project.

4.1 Effects Common to Both Alternatives

Both of the alternatives include continued operation of the Project. As such, many of the resources would be affected equally by the Proposed Action or No Action Alternative.

4.1.1 Eagles

Both of the alternatives include continued operation of the Project, which has the potential to result in take of eagles. Potential direct and indirect effects of continued operation of the Project on bald eagles include the risk of collision, electrocution, and disturbance/displacement. The level of direct mortality in the LAP caused by the Project and other reasonably foreseeable projects in relation to annual allowable take for bald eagles are provided below under cumulative effects. As the action being analyzed in this document is issuance of an ETP, impacts from the construction of the Project are not relevant to this analysis. Additional details on the potential direct and indirect effects of the Project are provided in the Project's ECP (Attachment A). Additionally, the PEIS (Service 2016a) analyzes impacts of permit issuance nationally.

The timing of the observed eagle use during surveys at the Project suggests that individuals pass through as migrants in addition to use by breeding residents. Many of the flight paths observed occurred near operational turbines and at heights that expose bald eagles to the spinning blades, suggesting that there is collision risk. However, no collisions were observed during the eagle use surveys, and no eagle fatalities were detected during standardized carcass searches (although one bald eagle fatality was found incidentally, see section 3.1.5; and only incidentally documenting birds at GMWF). Taken together with studies that suggest bald eagles demonstrate avoidance behavior at operational turbines (e.g., Sharp et al. 2012) and that collision risk may be a function of specific high-risk behaviors during flight, the bald eagle collision risk at the Project may not be directly proportional with post-construction eagle use.

The potential for displacement or disturbance of eagles is somewhat offset by the baseline disturbance in the Project, which includes daily agricultural activity and traffic along the roads in the Project vicinity. The presence and success of Nest 2016-01 within 150 meters of an existing turbine seems to suggest a possible tolerance of some level of disturbance at least by this eagle pair. Additionally, a new nest was constructed in the area west of Turbine 17 in late 2017. Based upon the construction of new nests and their occupancy and success during operations, it appears that territories can continue to be occupied by breeding bald eagles in some situations. No increases to displacement or disturbance are expected from implementation of either alternative.

4.1.2 Federally Listed Species

The Service conducted an intra-agency Section 7 consultation under the Endangered Species Act (Attachment B). The issuance of an eagle take permit will not have significant or negative impacts on northern long-eared bat or prairie bush clover, so no impacts are expected from either the No Action Alternative or Proposed Action. While wind facilities in general have negative impacts on migratory bats,

we do not anticipate the issuance of our eagle take permit to increase or decrease this impact. If northern long-eared bats were to occur in the area, risk could potentially be minimized by implementation of some of the conservation measures that would be adopted by the Proposed Action (see Attachment A, Section 10.0). The Section 7 consultation determined that the proposed action may affect, but is not likely to adversely affect the northern long-eared bat, and will have no effect on prairie bush clover.

Section 5.1.2.3 of the Applicant's Bird and Bat Conservation Strategy[4] summarizes notification requirements; that the Applicant would notify the Service within 24 hours of discovery; if a dead or injured federally-listed species is found.

4.1.3 Migratory Birds

Post-construction fatality monitoring was conducted at PVWF from May 2016 to May 2017 (see Section 3.1.3.2). The estimated annual fatality rate for all birds was 0.68 birds per MW per year. As no raptor fatalities were detected during standardized carcass searches over the course of the study, this also represents the non-raptor fatality estimate, and a raptor estimated annual fatality rate could not be generated. All of the bird species identified in the PVWF post-construction fatality survey are protected from purposeful take under the Migratory Bird Treaty Act; however, none of the fatalities were identified as federal or state listed species, or state species of special concern.

Post-construction fatality monitoring was conducted for bats at the GMWF in 2013 and 2014, which collected incidental observation data for birds. No large birds were incidentally observed during the standardized searches for bat fatalities at the GMWF site. Seven small birds were identified as fatalities as 2013, and none in 2014 (WEST 2014b). No state or federally endangered or threatened bird species were identified among the fatalities.

Given the intensive agricultural landscape at the Project, the relatively low number of fatalities found during monitoring at PVWF, and low overall fatality rates at other regional wind facilities, it is anticipated that continued operation of the Project is unlikely to have significant impacts on avian species and populations, including migratory birds. While wind facilities in general can have negative impacts on migratory birds, the issuance of our eagle take permit is not anticipated to increase these impacts. There would be no change to existing impacts to migratory birds from implementation of either the No Action Alternative or the Proposed Action. However, the implementation of the Proposed Action could have some beneficial impacts to migratory birds through implementation of conservation measures as described in the ECP (Attachment A, Section 10.0).

[4] Pleasant Valley Wind Farm Bird and Bat Conservation Strategy, March 2018. https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7b10EC2562-0000-C016-A4D2-56C97E1AA8E4%7d&documentTitle=20183-141006-01

4.1.4 Cultural Resources

Cultural resources assessments were complete for the Project during the pre-construction planning process. No additional ground disturbance or impacts to known cultural or historic resources are associated with either the No Action Alternative or Proposed Action, thus cultural resources would not be impacted from implementation of either alternative.

4.1.5 Socioeconomic Interests

No negative impacts to socio-economic interests in the area are expected from implementation of either alternative. Some beneficial impacts could be realized from implementation of the Proposed Action, through the creation of jobs associated with permit compliance.

4.1.6 Climate Change

Implementation of either alternative would not result in direct production of emissions or emissions reductions. Therefore, neither alternative would have any direct impacts to climate change, either adverse or beneficial.

4.2 Proposed Action

In determining the significance of effects of the Project on eagles, we screened the Proposed Action against the analysis provided in the PEIS (Service 2016a) and the Service's 2016 report, "Bald and Golden Eagles: Status, trends, and estimation of sustainable take rates in the United States." We also used our eagle-risk analysis (Service 2013, Appendix D), and Cumulative Effects Analysis (Service 2013, Appendix F) to quantify eagle fatality risk and cumulative local population level effects.

4.2.1 Bald Eagle

Permitted Take: Under the Proposed Action, we estimate 6 bald eagles may be taken over the span of the 5-year permit tenure. We anticipate the Project will take up to 30 bald eagles over the 30-year lifespan, although the Proposed Action will not cover the Applicant for the full 30-years. This prediction is based on a conservative approach that is expected to overestimate annual and cumulative take at the outset of permit. We anticipate the prediction will decrease as we incorporate Project-specific monitoring data into the prediction as part of the permit's adaptive management process. The CRM summary can be found in Attachment A (Section 9.1) and is briefly discussed below.

4.2.1.1 Collision Risk Model

A discussion of the CRM can be found in the Service's ECP Guidance, Appendix D (Service 2013). Variables incorporated into the CRM (version CollisionModelv4) are summarized in the Project's ECP (see Attachment A, Section 9.1, Table 9) and in Tables 3, 4, and 5, below. Consistent with the Service's ECP Guidance definition of a project area and based on consultation with the Service, predicted take for the Project was modeled as single wind facility (see Attachment A, Section 9.1).

Table 3. Data Inputs for the United States Fish and Wildlife Service Bayesian Collision Risk Model

Season and Year[1]	Number of Survey Hours	Number of Bald Eagle Observations[2]	Number of Bald Eagle Minutes[1]
Fall 2009	40.1	0	0
Winter 2009–2010	20.3	3	6
Spring 2010	34.8	0	0
Summer 2010	35.0	1	0
Annual Total	130.2	4	6

1. Survey data are from pre-construction avian point counts performed at PVWF; no pre-construction use data are available from GMWF.
2. Summer 2010 observation was of a perched eagle and did not count as eagle minutes for the model.

Table 4. Data Inputs for the United States Fish and Wildlife Service Bayesian Eagle Fatality Model – Hazardous Area

Daylight Hours Per Year	Number of Turbines, Respective Blade Radius	
	PVWF	GMWF
4,461.55	100 turbines, 50.0 meters	67 turbines, 38.5 meters

Table 5. Predicted Take for Bald Eagles at the Project

Mean Exposure Rate	Standard Deviation of Exposure Rate	Mean Annual Predicted Fatalities	Standard Deviation of Predicted Fatalities	Upper 80th Percent Credible Limit
0.026	0.010	0.750	0.595	1.122

4.2.1.2 Avoidance and Minimization

A complete description of the avoidance and minimization measures (AMMs) can be found in the Applicant's ECP, Sections 6.0, 7.0 and 10. A summary of these measures is as follows:

Avoidance (Pre-construction)

- The Project was sited in heavily cultivated landscapes to avoid impacts to eagles and their habitats.
- Wind turbines at the Project were designed with tubular towers and no external ladders or platforms on the towers or nacelles were used to minimize eagle perching and nesting opportunities.
- The electrical collection systems for the Project were designed so that the electricity generated at each turbine would be collected by underground power collection lines within

the Project footprint. Burying collection lines diminishes the risk of eagle collision with or electrocution from this equipment.

- The Project meteorological (met) towers were designed to minimize collision risks for eagles by installing the minimum number of met towers needed and constructing met towers without permanent guy wires. Temporary guyed met towers were removed within 1 year of operation.
- Above-ground electrical lines (transmission lines), transformers, and conductors at the Project follow guidance from the Avian Power Line Interaction Committee (APLIC 2006, 2012) to avoid and minimize risk of potential eagle and other avian species collisions or electrocutions.
- The PVWF footprint and overall project size was significantly reduced from the original LWECS Site Permit (301 MW, up to 188 turbines on 72,800 acres) to the current size of 200 MW (100 turbines) on approximately 31,176 acres, reducing the potential collision risk to eagles. The project developer reduced the overall footprint, moved the project away from larger portions of potential habitat such as the Root River corridor, and minimized the presence of turbines near wetlands, thereby lowering the potential impact to eagles using these habitats to forage.
- The originally permitted PVWF required up to three substations and two overhead transmission lines, totaling more than 14 miles of overhead line. The updated configuration consists of a single project substation and a single overhead transmission line to connect to the substation, thus reducing the potential collision risk to eagles.
- Overhead electrical distribution lines can potentially result in the injury or electrocution of eagles due to their large wing span. Project design elements that have been incorporated into the Project's layout to reduce the risk of electrocution of eagles and other avian species includes burying the electrical collection system lines and implementation of Avian Power Line Interaction Committee guidance for above-ground electrical lines (transmission lines), transformers, and conductors.

Minimization (Post-construction)

- To reduce collision risk of bald eagles, Turbines 16, 17, and 18 were curtailed from March 2016 through August 2016. Nest 2016-01, located within close proximity to these three turbines, was active with one eaglet present in the nest. The turbines were curtailed until the eaglet fledged the nest and limited eagle activity was seen in the vicinity.
- In order to reduce collision risk to nesting bald eagles and their offspring, Nest 2016-01 was removed in December 2016 in accordance with permits from the Service and MNDNR, and subsequent nesting attempts by this same pair of eagles were removed in early 2016 (see Attachment A, Section 8.4.2).

- Eagles attempting to build a nest near a turbine will be discouraged by using non-lethal scare devices or tactics. An eagle depredation permit was obtained for the Project authorizing this activity, and non-lethal eagle hazing activities were carried out in the vicinity of former Nest 2016-01 in early 2017. USDA APHIS WS has provided O&M staff with training in the proper use of non-lethal hazing techniques (see Attachment A, Section 8.4.3).
- Site personnel have received training on avoiding disturbance or harassment of eagles or eagle nests.
- Site personnel have received training on identifying and reporting eagle nests.
- APLIC (2006, 2012) recommendations for overhead utilities maintenance will be followed to reduce risk of eagle electrocution and collision with electrical components.
- All post-construction monitoring (mortality monitoring, eagle use, and nest monitoring) data will be used to help determine both spatial and temporal eagle risk across the Project, so that any kind of operational minimization can be strategic.
- To reduce the collision risk of bald eagles, guyed temporary meteorological towers were removed and replaced with a non-guyed permanent lattice tower for meteorological monitoring. In the event that temporary towers may be installed as part of an operational assessment of the Project, guy wires will be marked with marker balls to improve visibility to birds and reduce collision risk for bald eagles.
- Rock and brush piles that could create prey habitat located adjacent to wind turbines will be removed to reduce prey sources for eagles and other raptors, including golden eagles in risk areas. Creation of these features will be prevented, to the extent practicable.
- Road kill or other large carcasses within the public right-of-way at the Project will be cleared by site personnel within 24 hours of discovery to avoid attracting bald eagles because bald eagles scavenge road-killed animals. Site personnel have developed guidelines for disposal of animal carcasses that are used at the Project (See Attachment A, Appendix B).

Adaptive Management: The proposed conservation measures include adaptive management that could result in additional monitoring and operational adjustments. All Applicant-committed conservation measures and adaptive management requirements are described in Sections 10.1 and 10.3.2 of Attachment A, the ECP and will be incorporated into permit conditions.

The adaptive management protocol presented in Table 6 will be implemented to ensure that the Applicant stays within the take authorized by the ETP. The Service and the Applicant will meet on an annual basis to evaluate projected take based on cumulative compliance monitoring results and decide on appropriate response actions, if any. A tiered approach will be utilized for Years 2 through 4 where advances in the stepwise response will be commensurate with the degree to which authorized take is projected to be exceeded and/or the time remaining in the permit term is so short that more significant action is necessary to maintain compliance with the permit conditions. The Applicant and the Service intend this approach to be flexible, with the potential for more than one tier level to be carried out in

response to a single trigger event or for tiers to be skipped if the response is not situation-appropriate. All response actions in the table below will be undertaken in coordination with the Service using best available science and all project-specific information collected to date. A timeline for each management response will be developed including check-ins and benchmarks, as well as measures to determine if a specific management action has been successful.

Table 6. Bald Eagle Adaptive Management at Yearly Compliance Checks

Results of Annual Cumulative Take Assessment	Response[1]
Projected take[2] ≤ Authorized take	No action other than continued implementation of conservation measures outlined in the ECP will be required.
Projected take[2] > Authorized take	*Tier 1*: Evaluate cumulative monitoring effort to date to assess whether take estimate may be inflated by limitations in survey design. If the Service and the Applicant conclude that additional monitoring years and/or revised monitoring results in a lower, more representative take estimate, then the Applicant will design and implement a revised fatality monitoring protocol in coordination with the Service. If changes to monitoring are unlikely to bring projected take below authorized take, then the Applicant will proceed to more advanced tiers. *Tier 2*: Assess available necropsy reports and other information on any observed eagle fatalities to determine if the cause or contributing risk factors can be determined (e.g. lead/rodenticide poisoning, disease, nest proximity, weather, presence of prey/carrion, season, etc.). Evaluate existing survey data or conduct additional surveys (e.g. nest surveys, flight path surveys, etc.), as needed, to assess for potential correlations in risk factors or a change in eagle use that explains the higher than expected take estimate. The Applicant has committed to a cost cap of $75,000 per year to these additional monitoring efforts. *Tier 3*: Use information collected in previously implemented Tiers regarding potential risk factors to design and implement conservation measures to further avoid or minimize risk to eagles, including but not limited to targeted seasonal turbine curtailment near nests or other areas of assumed eagle risk. Nest removal will also be explored. The Applicant has committed to a cost cap of $100,000 (including revenue losses from curtailment) to these efforts. *Tier 4*: If previously implemented mitigation/minimization efforts have failed to sufficiently reduce projected take under authorized take levels, a permit amendment to increase the permitted take will be evaluated. Work with the Service to determine if additional environmental analysis is necessary, including a supplemental assessment of proposed increased permitted take. If needed, ETP will be amended as appropriate.

Results of Annual Cumulative Take Assessment	Response[1]
	Tier 5: Use information collected in previous Tiers to design and implement conservation measures to further avoid or minimize risk to eagles, including but not limited to additional turbine curtailment, detection/deterrent technology in conjunction with curtailment, rodenticide reduction/education program, lead abatement and education program for hunters, and/or implementation and testing of a carrion removal program. The Applicant has committed to a cost cap of $200,000 per year to these efforts.
1. Includes uncertainty as to whether existing monitoring plan is providing adequate information to ensure the Project is in compliance with permit. 2. Projected take is the adjusted annual take estimate based on monitoring and any extenuating factors. Within the scheme of adaptive management, this value would be extrapolated to the full 5-year permit term to understand whether or not it would exceed authorized take.	

4.2.1.3 Nest Removal and Deterrent Activities as Adaptive Management

As described above, nest removal and deterrent activities were carried in 2016 and 2017 in response to the presence of Nest 2016-1 to reduce the risk of collision mortality to bald eagles at the Project. In the event of new eagle nests being built within the Project footprint, the Applicant will reach out to the Service to develop situational appropriate management actions to mitigate risk.

4.2.1.4 Cumulative Effects Analysis

Take of eagles has the potential to affect the larger eagle population. Accordingly, the 2016 PEIS analyzed the cumulative effects of permitting take of bald eagles in combination with ongoing unauthorized sources of human-caused eagle mortality and other present or foreseeable future actions affecting bald eagle populations. As part of the analysis, the Service determined sustainable limits to permitted take within each EMU (see Figure 5 for EMU locations). The take that would be authorized by this permit does not exceed the EMU take limit, so will not significantly impact the EMU eagle population. The avoidance and minimization measures that would be required under the permit, along with the additional adaptive management measures, are designed to further ensure that the permit is compatible with the preservation of the bald eagle at the regional EMU population scale.

Additionally, to ensure that eagle populations at the local scale are not depleted by cumulative take in the local area, the Service analyzed in the PEIS (Service 2016a) the amount of take that can be authorized while still maintaining LAPs of eagles. In order to issue a permit, cumulative authorized take must not exceed 5 percent of an LAP unless the Service can demonstrate why allowing take to exceed that limit is still compatible with the preservation of eagles. The eagle incidental take permit regulations require the Service to conduct an individual LAP analysis for each permit application as part of our application review.

We, therefore, considered cumulative effects to the LAP surrounding the Project to evaluate whether the take to be authorized under this permit, together with other sources of permitted take and unpermitted eagle mortality, may be incompatible with the persistence of the Project LAP. We incorporated data provided by the Applicant, our data on other eagle take authorized and permitted by the Service, and other reliably documented unauthorized eagle fatalities to estimate cumulative impacts to the LAP. The scale of our analysis is an 86-mile radius around the Project site. We conducted our cumulative effects analysis as described in the Service's ECP Guidance (Service 2013; Appendix F).

Project Permit Proposed Take

We are proposing to issue a permit with a take of up to 6 bald eagles over a 5-year period, derived from our collision risk model output of 1.122 eagles/year. We examined permitted and unpermitted take within an 86-mile radius (the natal dispersal rate of bald eagles) of the Project footprints. This 86-mile radius is considered the LAP of the Project. In order to look at the cumulative impact of our proposed permitted take on this LAP, we expanded our search to two times the Project LAP; this enabled us to examine the LAPs of permitted take where it overlaps with the Project LAP, and to consider a larger area of unpermitted take.

The Project LAP falls entirely within the Mississippi Flyway EMU. Because the 2016 Programmatic EIS (Service 2016a) analyzed both the 2009 and 2016 EMUs, we used the more site-specific Eagle Density Units for the Great Lakes Region, rather than the entire Mississippi Flyway. The project also falls entirely within the Great Lakes Eagle Density Unit Area.

Local Area Population Benchmarks

As discussed in the Service's 2016 PEIS, if take exceeds 5 percent of the estimated population size within the LAP area, additional take is considered inadvisable unless the permitted activity will actually result in a lowering of take levels.

We estimate the number of bald eagles within the Project LAP to be 1,416.09 eagles, which would give a 1 percent and 5 percent benchmark of 14.16 and 70.8 bald eagles, respectively. The PEIS analyzed take of up to 5 percent of the LAP benchmark; take higher than this can be permitted but would require additional NEPA analysis and additional mitigation if necessary.

Permitted Take

We ran the Service's Cumulative Effects Tool (CET) on February 25, 2020, using the most current data available on permitted take. The CET calculates the LAP of eagles for an activity or project under consideration for a permit (focal project), and then summarizes existing and ongoing take that may affect the same LAP. This includes all known sources of permitted and unpermitted eagle take within the LAP and areas surrounding the LAP. The analysis allows for a contextual assessment of cumulative impacts on the LAP of eagles associated with the focal project, and provides a scientifically defensible decision process for determining the allowable levels of take that can be permitted sustainably under each permit for each eagle species affected. We found 13 permitted projects that had overlapping LAPs

with the Project LAP. The majority of these were nest disturbance permits. The total overlapping take for one year was 10.22 eagles (0.72 percent of the Project LAP). Overlapping take is estimated by taking the LAP of existing permitted projects and determining percent overlap with the focal area project, and multiplying the authorized take by that percentage. If the Project is permitted to allow take of 1.122 bald eagles per year, this would be a cumulative impact of 11.342 eagles a year (0.80 percent of the LAP).

Additionally, the Service issued a Habitat Conservation Plan to the MidAmerican Wind Company, which authorized incidental take of several listed and unlisted bat species and bald eagles under the Endangered Species Act. The MidAmerican LAP, which has a 23.71 percent overlap with this Project LAP, was determined by creating a minimum convex polygon around all the turbines from the 22 facilities present and creating a polygon of the entire permitted area. The Habitat Conservation Plan assumed that take (10 eagles a year) was distributed equally among all facilities. All documents for this final Habitat Conservation Plan, including the Environmental Impact Statement, can be found on the Service's Illinois/Iowa Ecological Services Field Office Website[5].

Table 7. Combined Existing Overlapping Permitted Take with Proposed Annual Take within the Project LAP

Results	Number of Eagles	Percent of LAP
Total Overlapping Take	10.22	0.72
Project Predicted Take	1.122	0.08
Project + Total Overlapping Take	**11.342**	**0.80**
Note: We note in this Final EA that the MidAmerican Wind Company, with permitted eagle take in Iowa, was inadvertently left out of the original analysis. This table and section have been revised to reflect the updated analysis.		

This percentage of the LAP is well below the 1 percent threshold; the effects of which have been analyzed in the PEIS and found to be within the preservation standard of bald eagles.

Unpermitted Take

In order to analyze unpermitted take, we used data from the Service's proprietary Injury and Mortality Database, accessed through the CET/LAP tool on September 26, 2019. These eagle mortality records represent the best available data on unpermitted eagle deaths. However, most records were obtained opportunistically or through incidental reporting, and not from systematic survey efforts to detect eagle fatalities using a statistically valid protocol or sampling methodology. The locations are not always exact, and dates of mortality are not always known. For most records, no searcher efficiency or carcass persistence trials were associated with the record, so a bias correction factor could not be applied. Some industries that impact eagles self-report eagle fatalities at a higher rate than other industries, and some types of eagle fatalities lend themselves better to discovery and reporting (e.g., road collisions). Finally, some recent eagle fatality records may not be available in the database due to on-going investigations

[5] https://www.fws.gov/midwest/rockisland/te/MidAmericanHCP.html

by the Service's Office of Law Enforcement or backlog in entering mortality data. We recognize the inherent bias associated with these data and recommend this analysis be viewed with a qualitative, rather than quantitative lens.

We looked at the overlap of the Project LAP and unpermitted take; thus, some unpermitted take may have occurred within the distance of up to two times the LAP of our focal project (172 miles; to account for the cumulative impact of overlapping LAPs). We focused especially on mortality events that appeared to be consistent or reoccurring at regular intervals, and mortality events that the Service has identified as of high concern, such as lead poisoning and road mortality.

Between 2002 and 2018, there were 182 eagle deaths whose LAPs overlapped with the Project LAP. Averaged over the 16-year period, this yields 11.38 eagle deaths/year, which comprises 0.80 percent of the LAP. Of all 16 years examined, unpermitted take exceeded 1 percent (>14.16 eagles/year) on 5 individual years, although annual unpermitted take never exceeded 3.25 percent of the Project LAP.

We examined unpermitted take by suspected cause 2002-2018. The largest source of unpermitted take was unknown/not listed (42.9 percent), followed by lead poisoning (15.4 percent), electrocution (9.3 percent), undetermined trauma (8.6 percent), and eagles being shot (6.3 percent). This indicates a greater need for listing the cause of death or necropsy of recovered eagle remains, but we are not able to use this information to identify specific causes of death or areas of concern within the LAP. The majority of reported unpermitted take can be attributed to anthropogenic causes (lead poisoning, etc.). The level of anthropogenic unpermitted take does not rise to a level of additional analysis as recommended in the Service's 2016 PEIS, which is identified as 10 percent of the LAP. Identified types of unpermitted take allows for focus of future conservation efforts, if needed, within the LAP (lead abatement, vehicle-collision public information campaigns, etc.).

Significance Criteria

The take that would be authorized by this permit for the Project does not exceed 5 percent of the LAP and will not significantly impact local area eagle populations. Known unpermitted take within the LAP does not exceed 10 percent and does not appear concentrated by region or type of take. Granting the 5-year permit would meet the purpose and need by permitting potential eagle take through operation of the Project and is consistent with the preservation standard as identified in the Service's 2016 Eagle Rule Revision.

Cumulative Effects not Analyzed through the Service's Project-Specific LAP Analysis

Minnesota contains many operational windfarms, as well as windfarms that will be operational in the coming years. Within the Project LAP, there are currently an additional 69 wind facilities, totaling 1,611 additional turbines (Hoen et al. 2019). It is feasible eagles within this LAP may pass through areas containing these wind turbines. The anticipated mean build-out for wind power in Minnesota from 2016-2030 is 2,030 MW (Service 2016a), many of which will likely occur within the Project LAP.

Within a 172-mile radius of the Project (two-times the LAP, which is the extent to which another project's LAP may overlap with this Project LAP) there are 221 wind facilities totaling 4,029 turbines. It is

feasible that the impacts to eagles extending from the various wind farms could overlap, contributing to a cumulative landscape level impact. However, without site-specific information from eagle-related impacts of these projects, we cannot accurately assess the impact of this potential cumulative take.

Currently there are no pending long-term eagle permit applications that may be issued within this Project's LAP; however, the Service is aware of 5 additional wind facilities with LAPs that overlap with this Project LAP that are likely to be issued in 2019 or 2020. Impacts from this Project will be analyzed as part of the permitted take analysis for those future permit applications. The Service only knows the predicted take of two of these projects, which have a combined take of 4.15 eagles/year. However, due to the distance of these projects from the Project, the take occurring within the Project LAP is 0.06 percent. This additional potential has a negligible increase in the take within the Project LAP (an increase of 0.004 percent take within the LAP). The Service also anticipates future receipt of applications for disturbance and nest removal within the Project LAP. However, these permits tend to be short-term in duration (1-3 years); we anticipate the level of impact from these permits will stay consistent every year. Currently, the amount of take from short-term disturbance and nest removal permits within the Project LAP is 7.72 eagles/year, but with an overlapping impact of 0.54 percent of the LAP. Even with the anticipated impact of issuance of future long-term permits and yearly issuance of short-term disturbance and nest removal permits, the LAP and EMU limits are not expected to be exceeded.

While existing unpermitted wind developments, additional future wind developments, and other activities may further increase take within this Project's LAP during the lifespan of this permit, the Service cannot reasonably predict the resulting impacts to eagles of such projects when important aspects, such as their size, location, configuration, lifespan, and site-specific risk to eagles are currently unknown. There is no reasonable basis to consider such speculative impacts in this EA.

The Service recently issued a 30-year eagle take permit for the Rock Creek Wind Facility, in Atchison County, Missouri. As part of our cumulative impacts analysis, the LAP for this Project did not overlap with the LAP for Rock Creek Wind; therefore, we are not including the impacts of that project in our analysis.

As described in Section 3.1.5.1, a series of bald eagle nests have been constructed in a tree line near Turbine 17. The first nest was constructed in March 2016, after the Project was operational, and successfully produced one young in that year. This nest and five partially built replacement nests were removed during the following winter and spring. In fall 2017 a new nest was built and nesting occurred in both 2018 and 2019 with one young fledged in 2018. No telemetry has been attempted on either member of this pair and thus there is no information on territory size or local habitat use. The Applicant will maintain and monitor a camera on Turbine 17 to record eagle nesting activities near that turbine for as long as nesting is attempted at this site. This will allow the Applicant and the Service to document and respond to bald eagle behavior, and adaptively manage to avoid risk to the eagles. As this nest has been removed once, it may need to be removed again in the future to avoid exposing those eagles to the risk of turbine collision. Given the increasing bald eagle population in the LAP, it is not expected that the impact to this specific nesting pair would be significant over the long-term.

4.2.2 Golden Eagle

If known golden eagle records were to increase in the area in the future, risk could potentially be minimized by implementation of some of the conservation measures that would be adopted by the Proposed Action (Attachment A, Section 10.0). The CRM projected a take of less than one golden eagle over the 5-year permit duration (Section 3.2).

4.2.3 Migratory Birds

As noted above in Section 4.1.3, implementation of the either the No Action Alternative or Proposed Action would result in no change from existing impacts to migratory birds. However, the Proposed Action would include implementation of conservation measures (Attachment A, Section 10.0), which could minimize impacts or have beneficial effects to migratory birds.

4.2.4 Federally Listed Species

If northern long-eared bats were to occur in the area, risk could potentially be minimized by implementation of some of the conservation measures that would be adopted by the Proposed Action (Attachment A, Section 10.0).

4.3 Alternative 1 – No Action

Under the No Action Alternative, the Service would take no action, which means denying the ETP application and not issuing an ETP. Effects to migratory birds, federally listed species, cultural resources, socioeconomic resources, and climate change would be consistent with those described in Sections 4.1.1 through 4.1.5.

4.3.1 Impacts to Bald Eagles

Under the No Action Alternative, direct impacts of the operational Project to bald eagle populations would be identified through reporting of incidental finds during regular O&M activities. Under the No Action Alternative, the Project would continue to operate without an ETP and therefore would not meet the purpose and need for the federal action because the Service would not issue an ETP and the Applicant would not have regulatory assurances under the Eagle Act over the life of the Project. The Applicant currently has permits for eagle nest removal and depredation, which would likely continue to be renewed as necessary for the life of the Project.

The Project would continue to operate without a take permit. Take estimates as currently predicted would include the take of 6 eagles over the 5-year permit term. Should take of eagles occur under the No Action Alternative, the Applicant would be in violation of the Eagle Act.

Given the estimated effects of this alternative (presumed use of some voluntary avoidance and minimization measures to reduce risk), it is likely that the take of bald eagles associated with Alternative 1 would be similar to what is estimated for the Proposed Action; however, the No Action Alternative will

lack adaptive management that will be included in the Proposed Action will address unforeseen circumstances by triggering adaptive management. Given the likely similar estimated take, the No Action Alternative is not expected to result in significant adverse effects to the bald eagle population. However, the lack of requirements for the Applicant to follow the ECP and monitor the take of eagles over the life of the Project outside of the context of a permit would result in less certainty of the Project's impact.

4.3.2 Golden Eagles

Under Alternative 1, the Service would take no action on the permit application (for take of bald eagles) and no permit would be issued. As stated above for bald eagles, we assume the Applicant will take some reasonable steps to avoid taking golden eagles, but the Applicant will not be protected from enforcement for violating the Eagle Act should take of an eagle occur. Also, the lack of monitoring for an ETP will result in uncertainty of the Project's impacts on golden eagle.

4.3.3 Federally Listed Species

As noted above in Section 4.1.2, implementation of either the Proposed Action or No Action Alternative would result in no change from existing impacts to federally listed species. However, if northern long-eared bats were to occur in the area, risk could potentially be minimized by implementation of some of the conservation measures that would be adopted by the Proposed Action (Attachment A, Section 10.0).

4.3.4 Migratory Birds

As noted above in Section 4.1.3, implementation of either the Proposed Action or No Action Alternative would result in no change from existing impacts to migratory birds. However, the Proposed Action also would include implementation of conservation measures (Attachment A, Section 10.0), which could minimize impacts or have beneficial effects to migratory birds.

4.4 Comparison of Effects of Alternatives

Table 8 compares the effects of the Proposed Action and the No Action Alternative.

Table 8. Comparison of Proposed Action and No Action Alternative

Criteria	Proposed Action – Issue Permit	Alternative 1 – No Action
Eagle Take Levels	Estimated 6 eagles over 5 years	Estimated 6 eagles over 5 years
Avoidance and Minimization (AMMs)	Reduced eagle risk as identified in Section 4.2.1.2	None required. Applicant will likely implement some, but not all measures. Service will have no reports as to efficacy of AMMs.
Compensatory Mitigation	None	None
Permitted but Unmitigated Eagle Take	6 eagles over 5 years	Zero

Criteria	Proposed Action – Issue Permit	Alternative 1 – No Action
Adaptive Management (ADM)	As identified in Table 6 of EA	None
Data Collected by Service	Annual monitoring report of fatalities; reporting of eagle fatalities or injured eagles; information on the effects of specific applied conservation measures	None
Company Liability for Eagle Take	No (if in compliance with permit conditions)	Yes

Chapter 5: Mitigation and Monitoring

The Proposed Action incorporates measures to minimize and avoid to the maximum degree practicable, as required by regulation. To ensure that regional bald eagle populations are maintained consistent with the preservation standard, our regulations require that any take that cannot practicably be avoided and is above EMU take limits must be offset by compensatory mitigation. Based on ECP Guidance, the Service has determined that compensatory mitigation targeted to offset permitted mortality is not required for the Project (Service 2009, Service 2016d). The ECP Guidance states that if eagle populations are not healthy enough to sustain additional mortality, applicants must reduce the unavoidable mortality to meet the no-net-loss standard (Service 2013). As the population in Minnesota has increased over the past 20 to 25 years (MDNR 2018), the predicted take for the Project is not expected to exceed that which can be sustained by the LAP. Thus, authorized take remains below the EMU take thresholds and no compensatory mitigation is needed to meet the Eagle Act preservation standard.

Under the Proposed Action impacts to bald eagle populations would continue to be quantified through reporting of incidental finds during regular O&M activities. However, under the Proposed Action, the Project would also implement the ECP, including avoidance, minimization, standardized fatality monitoring, and adaptive management measures (see Attachment A, Sections 10.2 and 10.3). Because long-term data is not available on the efficacy of similar monitoring plans, the Service and the Project will meet annually to review data collected (including systematic searches. bias trials, and scavenging rates). If results reveal mortality rates significantly above predicted rates, or uncertainty exists regarding the confidence of estimated fatalities, the Service and the Project will determine if additional and/or different mortality monitoring needs are needed for the duration of the permit.

Chapter 6: Consideration of Public Input Received

The Service received one general question from the Shakopee Mdewakanton Sioux during the public comment period. That question did not create a change in this document; the question and response are summarized in Section 1.4.1. No other public comments were received. The Service did receive additional internal comment which prompted the revisions to this document as described in Section 1.4.

Chapter 7: Consultation and Coordination

The development of this EA included consultation and coordination between the Service and the Applicant. During development of this EA, the Service engaged interested tribes in the NEPA process. An initial NEPA kickoff meeting occurred on August 9, 2017, between the Service, the Applicant, and Tetra Tech, Inc. (Applicant's environmental consultant). Biweekly meetings via conference call have been held throughout the process of developing the EA to discuss consultation and EA development.

Chapter 8: References

APLIC (Avian Power Line Interaction Committee). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Washington, D.C., and Sacramento, California: Edison Electric Institute, APLIC, and California Energy Commission.

APLIC. 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC. Washington, D.C.

eBird. 2018. eBird: An online database of bird distribution and abundance [web application]. eBird, Mower County, Minnesota. Available: http://www.ebird.org. (Accessed: December 10, 2018).

ECOS (Environmental Conservation Online System). 2020. Species profile for Minnesota dwarf trout lily (*Erythronium propullans*). Accessed February 28, 2020, at: https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=597

Franson, JC. and Russell RE. 2014. Lead and eagles: demographic and pathological characteristics of poisoning, and exposure levels associated with other causes of mortality. Ecotoxicology 23:1722–1731.

GBBO (Great Basin Bird Observatory). 2010. Nevada Comprehensive Bird Conservation Plan, ver. 1.0. Great Basin Bird Observatory, Reno, NV. Available online at www.gbbo.org/bird_conservation_plan.html

Hoen, B.D., Diffendorfer, J.E., Rand, J.T., Kramer, L.A., Garrity, C.P., Hunt, H.E. 2019. United States Wind Turbine Database. U.S. Geological Survey, American Wind Energy Association, and Lawrence Berkeley National Laboratory data release: USWTDB V2.0 (April 24, 2019). https://eerscmap.usgs.gov/uswtdb.

MDNR (Minnesota Department of Natural Resources). 2006. 2005 Minnesota Bald Eagle Surveys. Available online at: http://files.dnr.state.mn.us/eco/nongame/projects/eagle_report_2005.pdf. Accessed March 13, 2018.

MDNR. 2018. Minnesota bald eagle surveys. Available online at: http://www.dnr.state.mn.us/eco/nongame/projects/baldeagle_survey.html. Accessed March 13, 2018.

National Eagle Center. 2017. About the Golden Eagle Project. Available online at: http://www.nationaleaglecenter.org/golden-eagle-project/. Accessed March 20, 2018.

Pagel, J. D., K. J. Kritz, B. A. Milsap, R. K. Murphy, E. L. Kershner, and S. Covington. 2013. Bald eagle and golden eagle mortalities at wind energy facilities in the contiguous United States. J. Raptor Res. 47(3):311-315.

Pleasant Valley Wind, LLC. 2014. Pleasant Valley Wind Energy Project Bird and Bat Conservation Strategy. April 2014. 254 pp.

Root, T. 1988. Atlas of wintering North American birds: An analysis of Christmas Bird Count data. University of Chicago Press. 336 pp.

Service (United States Fish and Wildlife Service). 2009. Eagle Permits; Take Necessary to Protect Interests in Particular Localities. Final Rule. Federal Register 74(175): 46836-46879. September 11, 2009.

Service. 2013. Eagle Conservation Plan Guidance. Module 1 – Land-based wind energy. Version 2. April 2013. Available online at: http://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf. Accessed April 6, 2018.

Service. 2016a. Programmatic Environmental Impact Statement for the Eagle Rule Revision. December 2016. Available online at: https://www.fws.gov/migratorybirds/pdf/management/FINAL-PEIS-Permits-to-Incidentally-Take-Eagles.pdf. Accessed March 13, 2018.

Service. 2016b. Potential Bird-Structure Collision Areas – Minnesota. Available online at: https://www.fws.gov/midwest/es/planning/Minnesota/pdf/MN_BirdCorridorsMap040611.pdf. Accessed March 20, 2018.

Service. 2016c. Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States. April 2016. Division of Migratory Bird Management, Washington D.C., USA. Accessed March 12, 2018 from: https://eagleruleprocess.org/files/Bald_and_Golden_Eagles_Status_Report_2016.pdf.

Service. 2016d. Eagle Permits; Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests. Federal Register Vol. 81, No. 242, 91494. December 16, 2016.

Service. 2019. Bald Eagle Population Size. Available online at: https://www.fws.gov/midwest/eagle/population/index.html. Accessed March 2019.

Sharp, L., C. Herrmann, R. Friedel, K. Kosciuch, C. Farmer, and R. MacIntosh. 2012. Bald Eagle Behavior Before and After Construction of the Pillar Mountain Wind Project in Kodiak, Alaska 2007-2011. Poster presentation at the Wind Wildlife Research Meeting IX. November 2012.

Tetra Tech, Inc. 2017. Draft Eagle Conservation Plan for Grand Meadow and Pleasant Valley Project. Prepared for Northern States Power Company–Minnesota dba Xcel Energy. July 2017. 135 pp.

WEST (Western EcoSystems Technology, Inc.). 2010. Avian Studies for the Pleasant Valley Wind Resource Area, Mower County and Dodge County, Minnesota. September 18, 2009 through August 28, 2010. Interim Report. Prepared for Pleasant Valley Wind, LLC. September 29, 2010. 18 pp.

WEST. 2014a. Pleasant Valley Wind Farm Project Biological and Natural Resource Inventory. Prepared for Pleasant Valley Wind, LLC. May 2014. 58 pp.

WEST. 2014b. Bat Fatality Rates and Effects of Changes in Operational Cut-in Speeds at Commercial Project in Southern Minnesota – Year 1. May 23, 2014. 166 pp.

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