Philip Wind Energy Center

Draft Environmental Assessment
Haakon County, South Dakota

Western Area Power Administration

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Table of Contents

1 Introduction 1-1
1.1 Purpose and Need for the Federal Action 1-2
1.2 Philip Wind Partners, LLC, Goal and Objective 1-2
1.2.1 Project History and Design Refinement 1-2
2 Description of Proposed Action and No Action Alternatives 2-1
2.1 Proposed Action 2-1
2.1.1 Switchyard 2-4
2.1.2 Wind Facility 2-4
2.2 No Action Alternative 2-7
2.3 Alternatives Considered But Dismissed From Detailed Analysis 2-9
3 Affected Environment and Environmental Consequences 3-1
3.1 Land Use and Public Facilities 3-2
3.1.1 Existing Conditions 3-2
3.1.2 Environmental Consequences: Proposed Action 3-5
3.1.3 Environmental Consequences: No Action Alternative 3-7
3.2 Geology, Soil, and Paleontological Resources 3-7
3.2.1 Existing Conditions 3-7
3.2.2 Environmental Consequences: Proposed Action 3-11
3.2.3 Environmental Consequences: No Action Alternative 3-13
3.3 Hydrologic Setting and Water Resources 3-13
3.3.1 Existing Conditions 3-13
3.3.2 Environmental Consequences: Proposed Action 3-15
3.3.3 Environmental Consequences: No Action Alternative 3-20
3.4 Air Quality and Climate 3-20
3.4.1 Existing Conditions 3-20
3.4.2 Environmental Consequences: Proposed Action 3-21
3.4.3 Environmental Consequences: No Action Alternative 3-26
3.5 Noise 3-26
3.5.1 Existing Conditions 3-26
3.5.2 Environmental Consequences: Proposed Action 3-26
3.5.3 Environmental Consequences: No Action Alternative 3-28
3.6 Vegetation 3-29
3.6.1 Existing Conditions 3-29
3.6.2 Environmental Consequences: Proposed Action 3-32
3.6.3 Environmental Consequences: No Action Alternative 3-35
3.7 Wildlife 3-35
3.7.1 Existing Conditions 3-35
3.7.2 Environmental Consequences: Proposed Action 3-39
3.7.3 Environmental Consequences: No Action Alternative 3-41
3.8 Special-Status Species 3-41
3.8.1 Existing Conditions 3-41
3.8.2 Environmental Consequences: Proposed Action 3-46
3.8.3 Environmental Consequences: No Action Alternative 3-50
3.9 Visual Resources 3-51
3.9.1 Existing Conditions 3-51
3.9.2 Environmental Consequences: Proposed Action 3-51

3.9.3 Environmental Consequences: No Action Alternative 3-54
3.10 Cultural Resources 3-54
3.10.1 Existing Conditions 3-54
3.10.2 Environmental Consequences: Proposed Action 3-57
3.10.3 Environmental Consequences: No Action Alternative 3-59
3.11 Socioeconomics 3-59
3.11.1 Existing Conditions 3-59
3.11.2 Environmental Consequences: Proposed Action 3-60
3.11.3 Environmental Consequences: No Action Alternative 3-62
3.12 Environmental Justice 3-62
3.12.1 Existing Conditions 3-62
3.12.2 Environmental Consequences: Proposed Action 3-63
3.12.3 Environmental Consequences: No Action Alternative 3-64
3.13 Health and Safety 3-64
3.13.1 Existing Conditions 3-64
3.13.2 Environmental Consequences: Proposed Action 3-66
3.13.3 Environmental Consequences: No Action Alternative 3-69
4 Cumulative Impacts 4-1
5 Consultation and Coordination 5-1
5.1 List of Federal Agencies 5-1
5.2 State and Local Agencies 5-2
5.3 Native American Tribes 5-2
5.4 Non-governmental Organizations 5-3
6 List of Preparers 6-1
7 Literature Cited 7-1

Appendices

Appendix A. Preconstruction Wind Turbine Noise Analysis
Appendix B. Eagle Utilization Distribution Monitoring Report
Appendix C. Whooping Crane Habitat Assessment Report
Appendix D. Prairie Dog Colony Status and Mapping Report
Appendix E. Northern Long-eared Bat Habitat Assessment Report
Appendix F. Raptor Nest Survey Report
Appendix G. Prairie Grouse Lek Survey Report
Appendix H. Grassland Habitat Assessment Report
Appendix I. Water Resource Analysis Report
Appendix J. Public Involvement
Appendix K. Programmatic Biological Assessment Project Consistency Evaluation Forms
Appendix L. Whooping Crane Monitoring and Contingency Plan
Appendix M. Shadow Flicker Report
Appendix N. Cultural Resources Report
Appendix O. Upper Great Plains Programmatic Environmental Impact Statement Best Management Practices

Figures

Figure 1-1. Proposed Project area in South Dakota. 1-6
Figure 1-2. Proposed Project area and former boundary. 1-7
Figure 1-3. Natural resource setbacks and preliminary turbine locations. 1-8
Figure 2-1. Preliminary Project layout. 2-3
Figure 3-1. National Land Cover Database types in the proposed Project area. 3-3
Figure 3-2. Farmland of statewide importance in the proposed Project area. 3-8
Figure 3-3. National Hydrography Dataset and National Wetlands Inventory features in the proposed Project area. 3-16
Figure 3-4. Vegetation types in the proposed Project area. 3-31

Tables

Table 1-1. Applicant-Committed Natural Resources Setbacks for Turbine Locations 1-4
Table 2-1. Maximum Potential Project Impact Summary 2-1
Table 2-2. Representative Turbine Options 2-4
Table 2-3. Applicant's Additional Voluntary Environmental Protection Measures 2-8
Table 3-1. Land Cover Types in the Proposed Project Area 3-2
Table 3-2. Existing Access Roads in the Proposed Project Area 3-4
Table 3-3. Wind Facility Disturbances by Land Cover Type 3-5
Table 3-4. Farmland Types In the Proposed Project Area 3-7
Table 3-5. Geological Units, Potential Fossil Yield Classification, and Typical Fossils 3-9
Table 3-6. Wind Facility Disturbances by Farmland Types in the Proposed Project Area 3-12
Table 3-7. National Hydrography Dataset Features Mapped in the Proposed Project Area 3-14
Table 3-8. National Wetlands Inventory Features Mapped in the Proposed Project Area 3-15
Table 3-9. Wind Facility Impacts to National Hydrography Dataset Features 3-18
Table 3-10. Wind Facility Impacts to National Wetlands Inventory Features 3-18
Table 3-11. Switchyard Construction Equipment List 3-22
Table 3-12. Wind Facility Construction Equipment List 3-23
Table 3-13. Project Operation Equipment List 3-24
Table 3-14. Project Decommissioning Equipment List 3-24
Table 3-15. Vegetation Types in the Proposed Project Area 3-29
Table 3-16. State and Local Noxious Weeds of South Dakota 3-32
Table 3-17. Vegetation Disturbance from the Wind Facility 3-33
Table 3-18. Philip Wind Energy Center Wildlife Studies 3-35
Table 3-19. Bat Species Potentially Occurring in the Proposed Project Area 3-38
Table 3-20. Acoustic Detections of Bats in the Proposed Project Area 3-38
Table 3-21. Federally Listed Species and their Potential to Occur in the Proposed Project Area 3-41
Table 3-22. Prairie Grouse Lek Survey Results 3-45
Table 3-23. Socioeconomic Key Measures for Haakon County and South Dakota (2021) 3-59
Table 3-24. Direct Long-Term Economic Benefits from Wind Facility 3-61
Table 3-25. Minority and Low-Income Populations (2021) 3-62
Table 4-1. Cumulative Impact Summary for the Proposed Action and No Action Alternative 4-1
Table 6-1. List of Environmental Assessment Preparers 6-1

Abbreviations

APE	area of potential effects
APLIC	Avian Power Line Interaction Committee
AVERT	Avoided Emissions and Generation Tool
BBCS	Bird and Bat Conservation Strategy
BCA	Beaver Creek Archaeology, Inc.
BCC	Birds of Conservation Concern
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BMP	best management practice
CFR	Code of Federal Regulations
CO_2	carbon dioxide
CO_2e mt	metric ton CO_2 equivalent
dB	decibel
dBA	A-weighted decibel
EA	environmental assessment
EMF	electric and magnetic field
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FR	*Federal Register*
gen-tie line	generation tie line
GHG	greenhouse gas
GIS	geographic information system
HAP	hazardous air pollutant
HUC	hydrologic unit code
Invenergy	Invenergy Wind Development LLC
IPaC	Information for Planning and Consultation
kV	kilovolt
m	meter
MET tower	meteorological tower
MW	megawatt
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database

NLEB	northern long-eared bat
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O&M	operations and maintenance
PBA	Programmatic Biological Assessment
PEIS	programmatic environmental impact statement
PFYC	Potential Fossil Yield Classification
Philip Wind Partners	Philip Wind Partners, LLC
PM	particulate matter
PM_{10}	PM with a diameter of 10 microns or less
$PM_{2.5}$	PM with a diameter of 2.5 microns or less
PTRCS	properties of traditional religious and cultural significance
Project	Philip Wind Energy Center
ROI	region of influence
SDDANR	South Dakota Department of Agriculture and Natural Resources
SDGFP	South Dakota Game, Fish and Parks
SDPUC	South Dakota Public Utilities Commission
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SPP	Southwest Power Pool
SWCA	SWCA Environmental Consultants
Switchyard	Philip North Switchyard
TCS	Tribal Cultural Specialist
THPO	Tribal historic preservation office
TWI	The Wetlands Institute
UGP	Upper Great Plains
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
WAPA	Western Area Power Administration
Wind Facility	Philip Wind Facility

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1 INTRODUCTION

Philip Wind Partners, LLC (Philip Wind Partners or Applicant), has requested interconnection to Western Area Power Administration's (WAPA) existing Oahe to New Underwood 230-kilovolt (kV) transmission line at a new Philip North Switchyard (Switchyard) for Philip Wind Partners' proposed Philip Wind Facility (Wind Facility) (i.e., the wind energy generating facility, generation tie line [gen-tie line], and related infrastructure). The Wind Facility would be located on approximately 68,300 acres of private land north of the town of Philip in Haakon County, South Dakota (proposed Project area) (Figure 1-1, Figure 1-2). Together, the Switchyard and Wind Facility make up the Philip Wind Energy Center (Project).

The proposed Project area represents the greater area studied to site Project infrastructure. However, the Project infrastructure would be permanently sited on a much smaller area (approximately 1,291 acres of the proposed Project area would be temporarily disturbed during construction, and 108 acres would be permanently disturbed during operations). For the Wind Facility to interconnect with the existing line, WAPA would need to construct the Switchyard to control transmission to WAPA's existing system. Philip Wind Partners has executed an interconnection agreement with WAPA and Southwest Power Pool (SPP). Prior to executing an interconnection agreement, Philip Wind Partners' interconnection request was studied in accordance with the SPP Tariff and the Federal Power Act.

Because WAPA's decision on whether to grant Philip Wind Partners' interconnection request constitutes a "major federal action" under the National Environmental Policy Act (NEPA), WAPA is required to conduct an environmental review of the federal action and any connected actions in accordance with NEPA. WAPA's consideration of the approval of the Switchyard constitutes the proposed federal action, and the Wind Facility constitutes a connected action to that proposed federal action. Together, approval of the federal action and the connected action make up the Proposed Action evaluated by WAPA pursuant to NEPA.

This environmental assessment (EA) analyzes and discloses potential environmental impacts associated with the Proposed Action, consistent with NEPA. This EA tiers to the analysis conducted in the Upper Great Plains (UGP) Wind Energy Final Programmatic Environmental Impact Statement (PEIS), a document prepared jointly by WAPA and the U.S. Fish and Wildlife Service (USFWS) (WAPA and USFWS 2015).[1] The UGP PEIS was prepared to assess the environmental impacts associated with wind energy development in the UGP and to streamline future individual wind project environmental reviews by identifying best management practices (BMPs) to avoid, minimize, and mitigate potential impacts. As stated in the Executive Summary of the UGP PEIS, as long as wind energy projects are willing to implement the applicable evaluation process, BMPs, and conservation measures identified in the UGP PEIS, then the NEPA evaluation for that wind energy project may tier to the analyses in the UGP PEIS. Applicable material from the UGP PEIS is incorporated by reference in this EA in accordance with 40 Code of Federal Regulations (CFR) 1502.20 and 1508.28. The analysis in this EA is Project specific and focuses on site-specific issues not already addressed in detail in the UGP PEIS. This EA is intended to be read in conjunction with the UGP PEIS, and the EA and UGP PEIS together comprise WAPA's NEPA evaluation for the proposed federal action.

This EA is supplemented by several appendices. Appendix A provides the Preconstruction Wind Turbine Noise Analysis. Appendices B through I provide the results of natural resources surveys conducted in the proposed Project area. Appendix J documents Philip Wind Partners' responses to public comments and public involvement outreach efforts to date. Appendix K presents the USFWS Programmatic Biological

[1] The Upper Great Plains (UGP) Wind Energy Final Programmatic Environmental Impact Statement (PEIS) is referred to frequently throughout the EA, and therefore the author-date citation is provided here at first mention only.

Assessment (PBA) Consistency Evaluation Forms. Appendix L is the Whooping Crane Monitoring and Contingency Plan. Appendix M is the Shadow Flicker Report, and Appendix N is the Cultural Resources Report. Appendix O provides a list of BMPs that are based on the resource-specific BMPs identified in the UGP PEIS.

1.1 PURPOSE AND NEED FOR THE FEDERAL ACTION

In accordance with the SPP Tariff and the Federal Power Act, as detailed in Section 1.1.1 of the UGP PEIS, WAPA must consider and respond to Philip Wind Partners' request to interconnect the Project to WAPA's existing Oahe to New Underwood 230-kV transmission line, which includes the construction and operation of a new WAPA-owned Switchyard. Executive Order (EO) 14057 – *Catalyzing Clean Energy Industries and Jobs* requires agencies to achieve 100% carbon pollution-free electricity by 2030. Additionally, the EO states that the federal government shall achieve net-zero emissions economy-wide by no later than 2050. This action is consistent with the intent of EO 14057.

1.2 PHILIP WIND PARTNERS, LLC, GOAL AND OBJECTIVE

Philip Wind Partners' goal and objective for the Project is to provide a source of domestic, clean energy to the power grid. To accomplish this goal and objective, the Project must be technically, environmentally, and economically feasible. To that end, Philip Wind Partners needs the following factors to be present:

- A reliable wind resource capable of producing enough energy for the Project to be economically viable.
- Landowners willing to enter into commercial agreements for the siting of the Project's facilities.
- Environmental conditions that allow the Project to avoid, minimize, or mitigate potential adverse environmental impacts to the extent practicable.
- Interconnection of the Project to a regional transmission line proximate to the Project with sufficient capacity and a voltage between 115 kV and 345 kV.
- A power purchase agreement (or agreements) for the sale of energy from the Project.

1.2.1 Project History and Design Refinement

The Project was originally proposed by Philip Wind Partners (formerly owned by Southern Power Company) to WAPA in 2017. The general location of the Project is situated in an area of "excellent" wind energy resource with "high suitability" for wind energy development (WAPA and USFWS 2015). When Invenergy Wind Development LLC (Invenergy) acquired Philip Wind Partners (and with it the Project) from Southern Power Company in September 2019, the former Project area encompassed approximately 71,000 acres and was designed with a layout focused on maximizing energy production. Since Invenergy's acquisition of Philip Wind Partners, Invenergy has modified the Project area to address comments from regulatory agencies and the public to avoid, minimize, or mitigate potential adverse impacts to environmental resources based on collected field data (Figure 1-2). For example, the Project layout that Invenergy acquired included turbines sited on grasslands, including unbroken grasslands (see Appendix H for additional information on grasslands). Through design refinements, Philip Wind has shifted all turbine locations to avoid unbroken grasslands within the proposed Project area (see Table 1-1).

Invenergy conducted additional natural resource surveys and introduced the new Philip Wind Partners Project team to USFWS and the South Dakota Game, Fish and Parks (SDGFP). During an initial meeting with USFWS and SDGFP in May 2022, the Project team shared the natural resource survey methods and incorporated the agencies' feedback into the survey plans. In addition, Philip Wind Partners kicked off monthly meetings with WAPA in September 2022 and incorporated WAPA's resource specialists' feedback into the survey plans. Philip Wind Partners met with USFWS and SDGFP again in January 2023 to provide an update on previously completed studies and studies planned for 2023 through 2024. In that meeting, Philip Wind Partners demonstrated how the field data were incorporated into the Project design to avoid and minimize potential impacts to species habitat and sensitive resources.

Philip Wind Partners also presented to USFWS the Project's proposed approach to Endangered Species Act (ESA) compliance pursuant to USFWS's PBA, which provides for expedited programmatic Section 7 consultation through adherence to the BMPs and conservation measures set forth in the PBA, as documented in the PBA Consistency Evaluation Forms (see Appendix K). As explained in the PBA, a project applicant's voluntary commitment to implement the measures set forth in the PBA Consistency Evaluation Forms results in an effects determination of "no effect" or "not likely to adversely affect" pursuant to the ESA Section 7 process. Between September 2022 and April 2023, Philip Wind Partners worked with USFWS and WAPA to ensure the Project's adherence with the PBA's Consistency Evaluation Forms to address ESA compliance. The PBA Consistency Evaluation Forms were finalized and signed by Philip Wind Partners, USFWS, and WAPA in April 2023.

Following the completion of the 2023 prairie grouse lek and raptor nest resource surveys, Philip Wind Partners presented the findings to USFWS and SDGFP in July 2023. In coordination with SDGFP and USFWS, Philip Wind continues to update the Project design in response to 2022 and 2023 resource survey results and will continue to coordinate with USFWS and SDGFP throughout Project development using the established collaborative process.

Table 1-1 and Figure 1-3 demonstrate the design revisions and setbacks that Philip Wind Partners has applied to siting the turbine locations to minimize disturbance to natural resources. The turbine locations (primary and alternate) were carefully selected to minimize impacts to sensitive resources identified in the natural resource surveys (see Appendices B through I) and in adherence with the PBA Consistency Evaluation Forms (see Appendix K), thus demonstrating compliance with ESA Section 7. The natural resource setbacks and PBA Consistency Evaluation Forms setbacks have been applied to all turbine locations (see Table 1-1 and Figure 1-3).

Philip Wind Partners has also worked closely with WAPA to support consultation with federally recognized Native American governments early in the planning process. In 2018, Philip Wind Partners' archaeological consultant, Beaver Creek Archaeology, Inc. (BCA), and Tribal Cultural Specialists (TCSs) from several Native American governments participated in cultural resource surveys. In 2023, Philip Wind Partners engaged BCA to continue evaluating the area of potential effects (APE) for potential archaeological sites. Philip Wind Partners and WAPA also requested that TCSs evaluate the APE for potential traditional cultural properties. Philip Wind Partners and WAPA have continued to rely on Native American governments to complete site-specific assessments to inform the cultural resource survey and support WAPA's consultation under Section 106 of the National Historic Preservation Act (NHPA).

Table 1-1. Applicant-Committed Natural Resources Setbacks for Turbine Locations

Category	Setback	Description	Setback Origination
Wetlands with a score of 4–11 from the Wetlands Institute (TWI) (see Appendix C)	1,000 feet	No turbines would be sited within 1,000 feet of wetlands with a TWI score of 4–11.	Applicant-committed setback in response to natural resources surveys
Wetlands with a TWI score of 12–14	0.5 mile	No turbines would be sited within 0.5 mile of wetlands with a TWI score of 12–14.	Applicant-committed setback in response to natural resource surveys
Native (unbroken) sod grasslands	–	No turbines would be sited on native (unbroken) sod grasslands.	Applicant-committed setback in response to natural resource surveys
Sharp-tailed grouse leks (*Tympanuchus phasianellus*)	1 mile	No turbines would be sited on unbroken grasslands within 1 mile of known active sharp-tailed grouse leks.	Applicant-committed setback in response to natural resource surveys
Sharp-tailed grouse leks	–	No turbines would be sited on tier 1 or tier 2 priority habitat areas.	Applicant-committed setback in response to natural resource surveys
Greater prairie-chicken *(Tympanuchus cupido)*	1 mile	No turbines would be sited on unbroken grasslands within 1 mile of known active greater prairie-chicken leks.	Applicant-committed setback in response to natural resource surveys
Greater prairie-chicken	–	No turbines would be sited on tier 1 or tier 2 SDGFP priority habitat areas.	Applicant-committed setback in response to natural resource surveys
Prairie dog (*Cynomys* sp.) colonies	500 meters (m)	No turbines would be sited within 500 m of known active prairie dog locations.	Applicant-committed setback in response to natural resources surveys
Bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) nests	2 miles	No turbines would be sited within 2 miles of known bald and golden eagle nests.	Applicant-committed setback in response to natural resources surveys
Red-tailed hawk (*Buteo jamaicensis*) nests	800 m	No turbines would be sited within 800 m of known red-tailed hawk nests.	Applicant-committed setback in response to natural resources surveys
Northern long-eared bat (*Myotis septentrionalis*) (NLEB)	5 miles	No turbines would be sited within 5 miles of hibernacula used by NLEB (the nearest known hibernaculum is approximately 68 miles from the proposed Project area in Black Hills, South Dakota).	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
NLEB	0.5 mile	No turbines would be sited within 0.5 mile of known or presumed occupied foraging, roosting, and commuting NLEB habitat.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
Piping plover (*Charadrius melodus*)	1.5 miles	No turbines would be sited within the Missouri (including Niobrara River) and Yellowstone River system floodplains or any closer than 1.5 miles from known and suitable sandbar habitat and reservoir shorelines with nesting, resting, and foraging areas. The nearest reported piping plover is a 2014 sighting approximately 20 miles south of the proposed Project area. In addition, other reported observations are 60 miles east of the proposed Project area around Pierre, South Dakota, and in designated critical habitat for the species, which is approximately 30 miles to the northeast.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
Piping plover	1.5 miles	No turbines would be sited within the Platte River (including Loup and Elkhorn Rivers) system floodplain or any closer than 1.5 miles from known and suitable riverine habitat.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms

Category	Setback	Description	Setback Origination
Piping plover	1.5 miles	No turbines would be sited within 1.5 miles of known sandpit nesting, resting, and foraging areas along the Platte River (including Loup and Elkhorn Rivers) system.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
Piping plover	3 miles	No turbines would be sited within 3 miles of alkali lakes where piping plover nesting has been documented or those designated as critical habitat.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
Piping plover	3 miles	No turbines would be sited in between any alkali lakes identified with a 3-mile buffer where the outer limit of the buffer zones is less than 3 miles apart.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
Piping plover	1.5 miles	No turbines would be sited within 1.5 miles of riverine designated critical habitat or 3 miles of alkali wetlands designated as critical habitat.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
Whooping crane (*Grus americana*)	5 miles	No turbines would be sited within 5 miles of designated critical habitat (the nearest critical habitat is over 200 miles away from the proposed Project area near Lexington, Nebraska).	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms

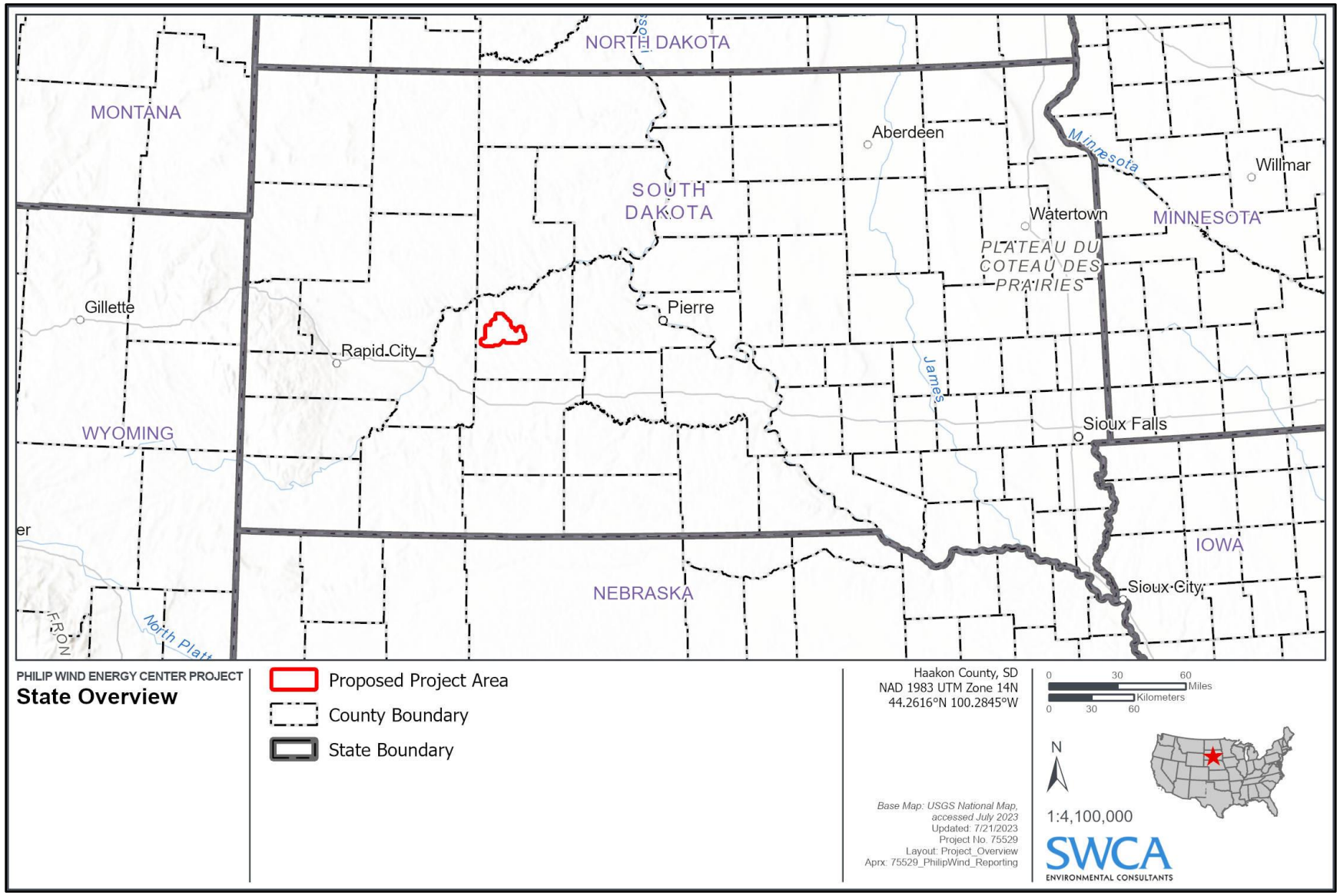

Figure 1-1. Proposed Project area in South Dakota.

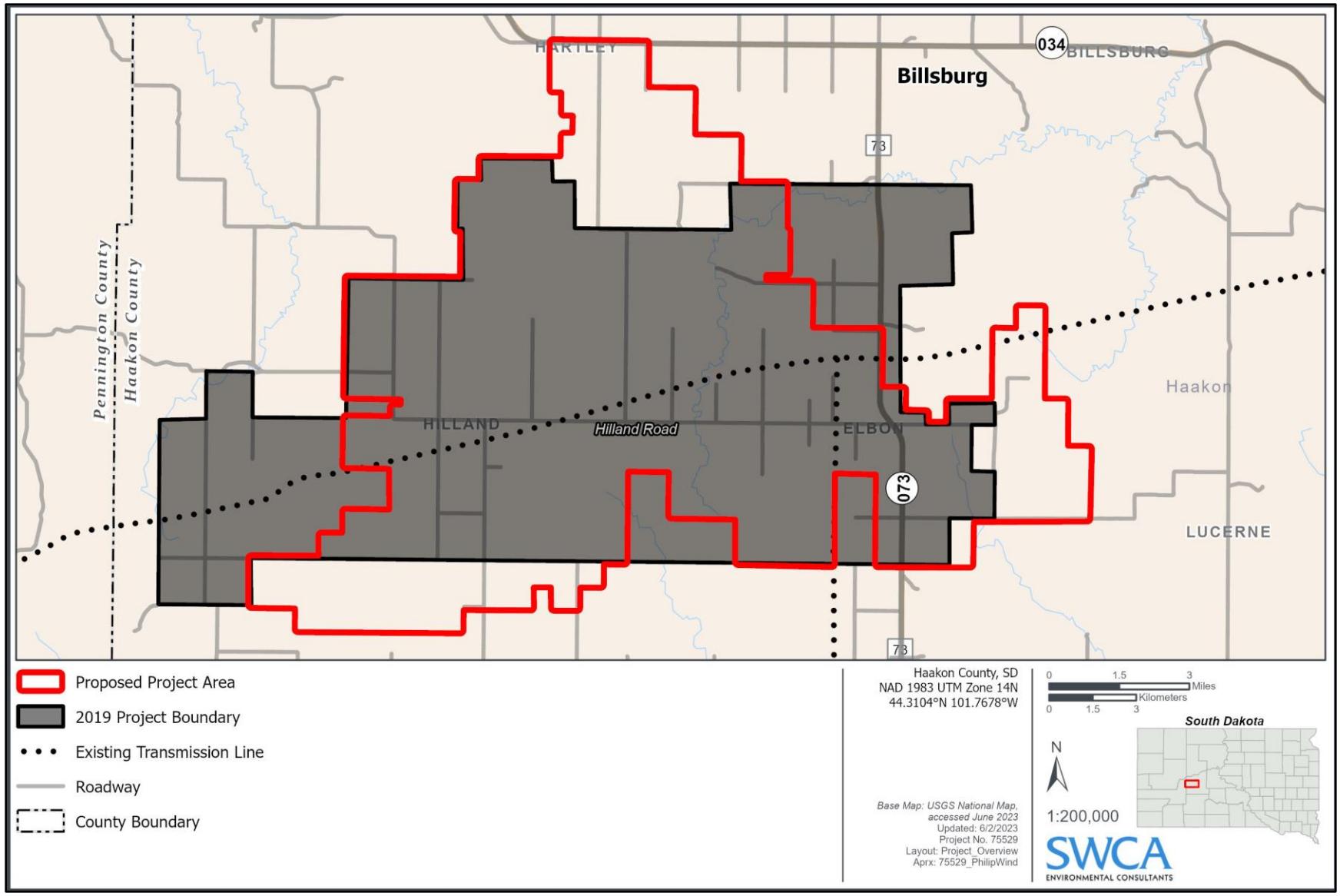

Figure 1-2. Proposed Project area and former boundary.

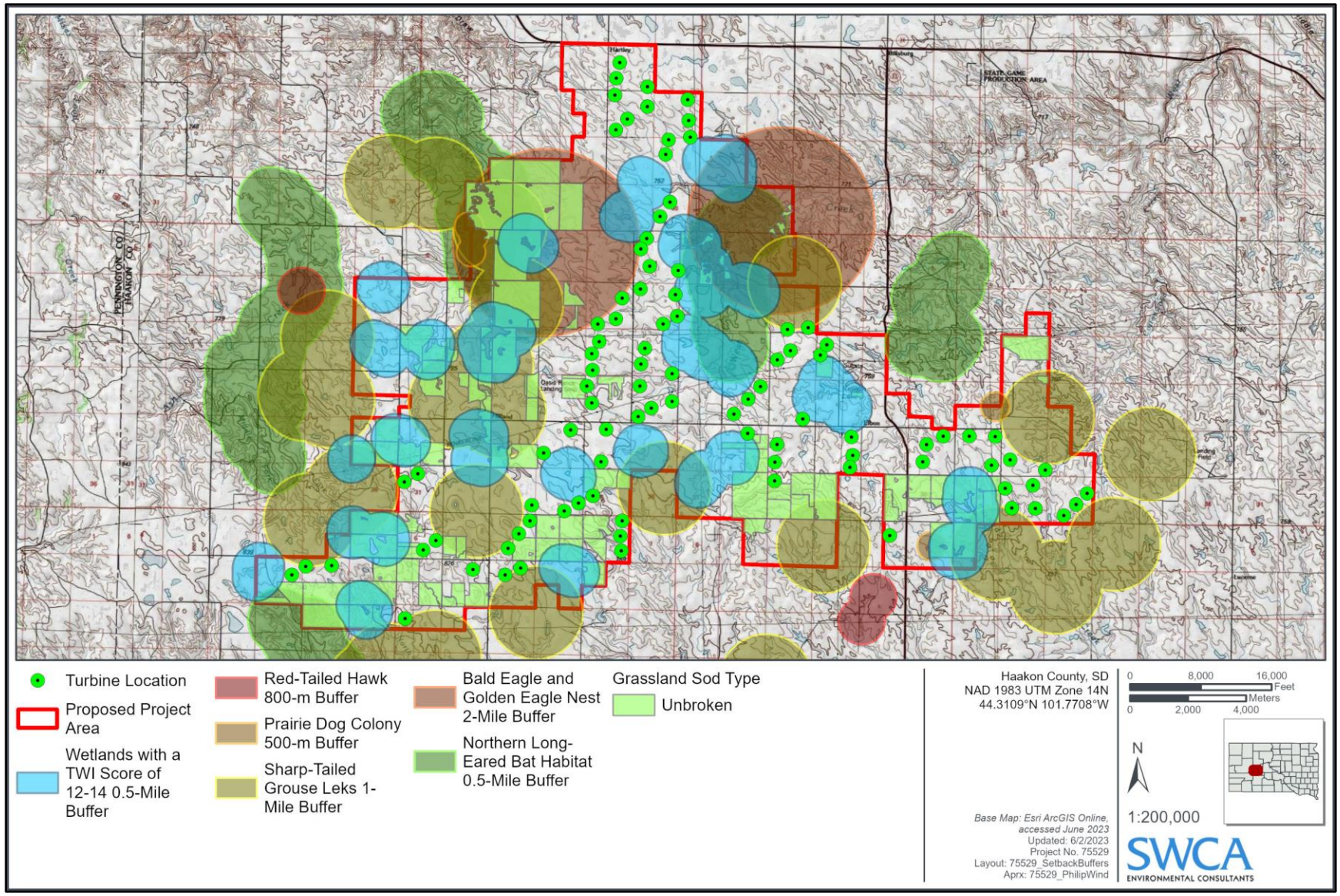

Figure 1-3. Natural resource setbacks and preliminary turbine locations.

Notes: TWI 4-11 and tiered prairie grouse habitat not depicted for clear viewability; sharp-tailed grouse lek locations represent 2022 survey results finalized as of publication.

2 DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVES

This EA analyzes two alternatives, the Proposed Action and the No Action Alternative.

2.1 PROPOSED ACTION

WAPA's proposed federal action is its decision to approve Philip Wind Partners' interconnection request, which would include the construction and operation of a new WAPA-owned Switchyard to interconnect the Wind Facility to the existing Oahe to New Underwood 230-kV transmission line. WAPA has regulatory authority to consider and act upon requests for interconnection; these requests are evaluated on a case-by-case basis. As defined in Section 2.1.1 of the UGP PEIS, "WAPA uses the NEPA process to evaluate and disclose the potential environmental effects of granting interconnection requests" (WAPA and USFWS 2015). Although WAPA has decision-making authority to act upon requests for interconnection, WAPA "does not directly authorize or permit developer projects, including wind energy development projects[,]" such as the Project (WAPA and USFWS 2015).

As part of the NEPA scoping process and consistent with the requirements of 40 CFR § 1501.9(e)(1), WAPA has determined that the Wind Facility (i.e., the wind energy generating facility, gen-tie line, and related infrastructure) is a connected action to the proposed federal action because if WAPA were to approve the interconnection request, Philip Wind Partners would develop the Project. Therefore, for purposes of analyzing and disclosing the potential environmental impacts of the proposed federal action, this EA evaluates both WAPA's proposed federal action and the connected action. Collectively, these activities make up the Proposed Action and are referred to as the Project. Table 2-1 provides a summary of the maximum potential for disturbance associated with the Project, and Figure 2-1 displays the current Project layout.

The proposed infrastructure listed in Table 2-1 for the Project includes factors that result in an overestimation of impacts. The Project's calculated disturbances are based on a preliminary design of this infrastructure that incorporates extra facilities, such as alternate turbine locations, as noted in the table. This analysis also assumes that the largest turbine model would be built at each of the potential turbine sites, although based on these assumptions, the Project would exceed the total nameplate generation capacity of 300 MW. For the purposes of this EA analysis, the overestimation of actual disturbance was intentional to ensure that the maximum potential for Project impacts is considered.

Table 2-1. Maximum Potential Project Impact Summary

Proposed Infrastructure	Assumptions	Construction and Decommissioning Footprint (temporary) Unit Dimensions	Construction and Decommissioning Footprint (temporary) Total Acreage	Operational Footprint (permanent) Unit Dimensions	Operational Footprint (permanent) Total Acreage
Switchyard	One switchyard	Approximately 600 × 635 feet	*0 acres*	Approximately 600 × 635 feet	9 acres
Subtotal for the Switchyard	–	–	*0 acres*	Approximately 600 × 635 feet	*9 acres*

Proposed Infrastructure	Assumptions	Construction and Decommissioning Footprint (temporary) Unit Dimensions	Construction and Decommissioning Footprint (temporary) Total Acreage	Operational Footprint (permanent) Unit Dimensions	Operational Footprint (permanent) Total Acreage
Wind Facility					
Wind turbines*	Up to 95 potential sites	225-foot radius	310 acres	50-foot radius	15 acres
Access roads	Up to 44 miles	40 feet wide	117 acres	16 feet wide	80 acres
Crane paths	Up to 49 miles	75 feet wide	264 acres	–	–
Underground collection lines†	Up to 138 miles; 20 aboveground junction boxes	40 feet wide	436 acres	5 × 5 feet per junction box	< 1 acre
Project substation	One substation location	Approximately 360 × 360 feet	3 acres	Approximately 295 × 295 feet	2 acres
Meteorological towers (MET towers)	Up to three MET towers (free standing)	150-foot radius	5 acres	1,285 square feet per tower	< 1 acre
Operations and maintenance facility	One operations and maintenance building	–	–	< 200 × 200 feet	< 1 acre
Temporary laydown yards	Three laydown yards (one 20-acre yard and two 10-acre yards)	1 approximately 930 × 930 feet 2 approximately 660 × 660 feet	40 acres	–	–
Gen-tie line structures footprint and work area easement	Up to 7 miles long; 62 structures spaced out 600 feet and two poles per structure	200 feet wide	93 acres	14-inch radius per pole	< 1 acre
Gen-tie line associated access road	One access road up to 7 miles long	15 feet wide	11 acres	–	–
Basin Electric transmission line structures footprint and work area easement	Up to 1 mile long; nine structures spaced every 600 feet and two poles per structure	200 feet wide	14 acres	14-inch radius per pole	< 1 acre
Basin Electric transmission line associated access road	One access road up to 1 mile long	15 feet wide	2 acres	–	–
Subtotal for the Wind Facility	–	–	*1,291 acres*	–	*99 acres*
Total for the Project (Switchyard and Wind Facility)	–	–	*1,291 acres*	–	*108 acres*

Note: Sums of values may not add to total value shown due to rounding. Acreage calculations do not include areas of overlapping infrastructure (i.e., calculations do not double-count areas used for more than one purpose, such as access roads through turbine pads).

* Number of wind turbines is dependent on final turbine model selected but would include 90 turbines maximum. This preliminary design includes at least five alternate turbine locations.

‡ The underground collection line network of the preliminary design includes multiple collection line routes to each turbine, which in some places doubles the potential distance of line. The final collection line network would only require one connection between each set of turbines (e.g., linear connection network instead of mesh connection network). Because of this, the preliminary design overestimates the collection line distance.

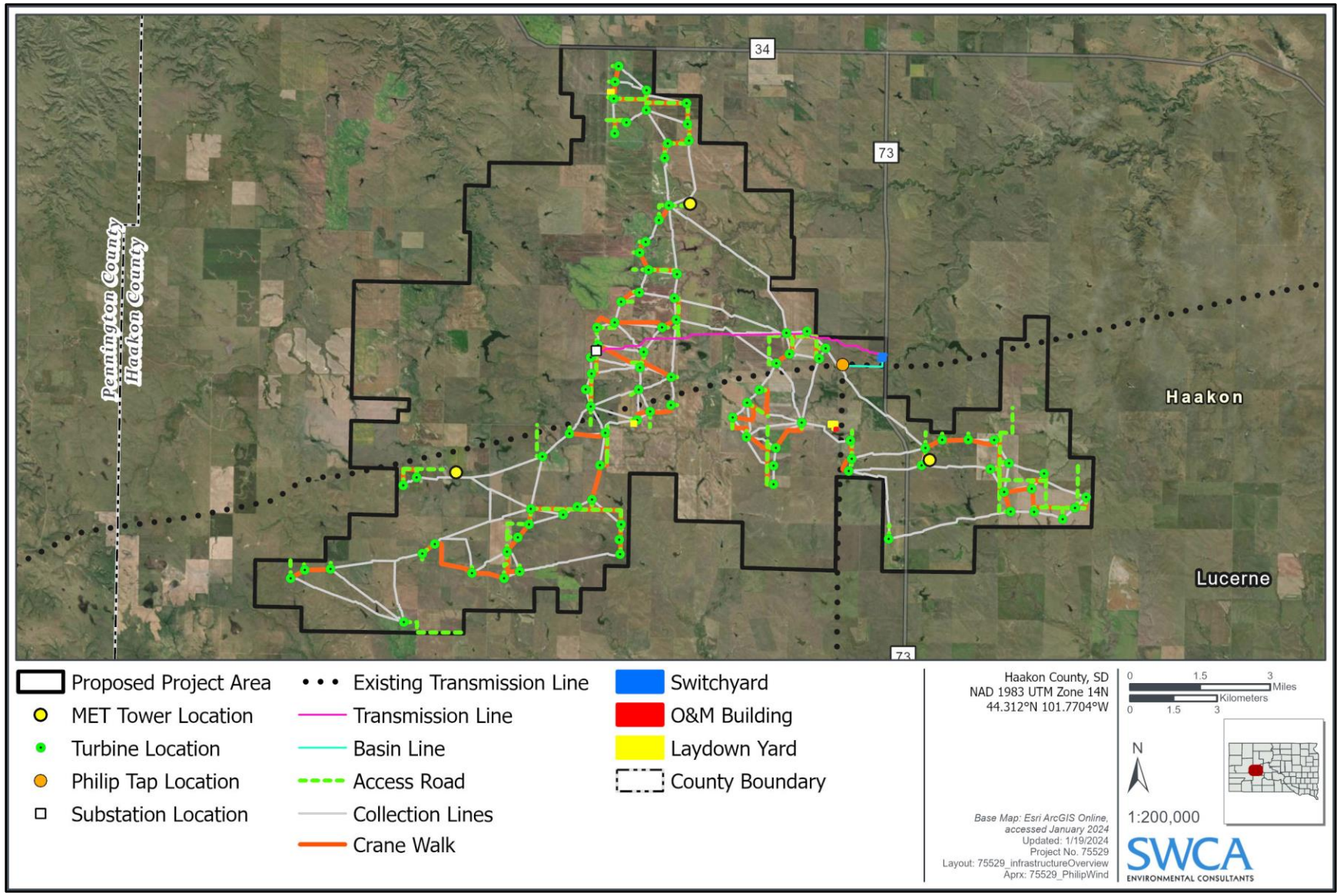

Figure 2-1. Preliminary Project layout.

2.1.1 Switchyard

The Switchyard would be located at the northeast corner of the proposed Project area along South Dakota Highway 73 and 213th Street. An existing facility is nearby: the Philip Tap, which is the interconnection point for the Basin Electric 230-kV transmission line to WAPA's Oahe to New Underwood 230-kV transmission line. The Switchyard's location would be approximately 1 mile east of the Philip Tap (see Figure 2-1). To accommodate both the existing Basin Electric interconnection and the Project interconnection, and to improve access to the Switchyard, WAPA proposes to construct the Switchyard at the more accessible location within the proposed Project area. The Switchyard would replace the existing Philip Tap, and both the Project and the Basin Electric transmission lines would interconnect at the proposed Switchyard.

The Switchyard would be a WAPA-owned 230-kV switchyard and would consist of four breaker ring buses with four 230-kV circuit breakers, 12 230-kV disconnect switches, instrument transformers, associated control and protection equipment, high-voltage buses, four transmission line take-off structures, one conductor, one overhead optical ground wire, communication equipment, and new transmission line structures to re-terminate the four lines (Oahe 230-kV transmission line, New Underwood 230-kV transmission line, Basin Electric 230-kV transmission line, and the Project 230-kV transmission line) into the Switchyard.

Construction and operation of the Switchyard would result in approximately 9 acres of permanent land disturbance (see Table 2-1).

2.1.2 Wind Facility

2.1.2.1 Wind Turbines

The Wind Facility would consist of the installation of up to 95 turbines (see Figure 2-1). Multiple turbine models are being considered, with the highest turbine rating up to 6.1 megawatts (MW), although the number and model of turbines selected would not exceed a total nameplate generation capacity of 300 MW. The wind turbine generators would be supported by three-section tubular towers up to 370 feet (113 meters [m]) tall and have rotors that are up to 545 feet (166 m) in diameter. The anticipated blade tip height would be no more than 644 feet (196 m). Towers, blades, and generators would be white. Table 2-2 lists representative turbine options; a specific model has not yet been finalized. For purposes of impact assessment in this EA, the largest of these turbine models and the highest number of turbines have been analyzed, representing an overestimation of impacts.

Table 2-2. Representative Turbine Options

Model Name	Current Nameplate Capacity (MW)	Hub Height (feet)	Rotor Diameter (feet)	Tip Height (feet)	Rotor-Swept Area (square feet)
GE 140	3.4	334	460	564	165,700
Vestas 166	6.1	370	545	644	190,285
Vestas 163	4.5	370	535	637.5	190,210

2.1.2.2 Operations and Maintenance Facility

The operations and maintenance (O&M) building, as shown in Figure 2-1, would require less than 1 acre of permanent, long-term disturbance. To support the construction of the O&M building and other Project infrastructure, a total of 40 acres would be required for the use of three temporary laydown yards (see Table 2-1). One laydown yard would be sited in the same location as the O&M building, and the other two would be sited elsewhere in the proposed Project area (see Figure 2-1). All three laydown yards, apart from the O&M building footprint and gravel parking area, would be revegetated once construction is complete.

The O&M building would be a two-story building that would house operating personnel, offices, operations and communication equipment, and storage for parts and maintenance. Construction tools, materials, equipment, and vehicles would be stored at the laydown yard until needed for construction activities. The O&M building would include a gravel parking area and an outdoor storage area for larger equipment and materials, which would be fenced in for safety and security. The building would also have running water provided by the existing rural system.

2.1.2.3 Project Substation

The Project substation would be located within the central portion of the proposed Project area (see Figure 2-1) and would be surrounded by a security fence. At the Project substation, the electrical voltage would be stepped up from 34.5 kV from the underground connection lines to 230 kV for the Project gen-tie line. Construction of the substation would result in approximately 3 acres of land disturbance (see Table 2-1). Once operational, the substation would require 2 acres and would consist of two transformers, circuit breakers, switching devices, auxiliary equipment, a control enclosure (containing equipment for proper control, protection, monitoring, and communications), and other miscellaneous equipment. Approval for the Project substation would be subject to Haakon County's conditional use permit process.

2.1.2.4 Generation Tie Line and Basin Electric Transmission Line Extension

Originating from the Project substation, a 7-mile gen-tie line is proposed to connect the Project to the new Switchyard. The gen-tie line would be a single-circuit power line with a structure height of up to 200 feet tall. Approximately 62 transmission structures (two poles per structure) spaced 600 feet apart would be needed to support the gen-tie line. An access road would be required to each structure location for construction, and these access road areas would be reclaimed once construction is complete. The 230-kV gen-tie line would transmit the power from the Project substation to the Switchyard.

The gen-tie line would avoid any USFWS wetland easements and USFWS grassland easements because there are no known USFWS easements in the proposed Project area. Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms (see Appendix K) would be installed on all constructed overhead lines following Avian Power Line Interaction Committee (APLIC) recommendations. The markers would be maintained for the life of the Project.

In addition, the Project would require the extension of the existing Basin Electric transmission line from its current interconnection point at the Philip Tap to the new Switchyard, approximately 1 mile and requiring approximately 10 new transmission structures. No other lines would be upgraded as part of the Proposed Action.

During construction of the gen-tie line, the construction easement would be 200 feet wide and would include each transmission structure. Ground disturbance would occur from structure erection sites, temporary work areas, and access roads during construction; these areas would be reclaimed when

construction is completed. Following construction, Philip Wind Partners would retain 32 acres of right-of-way for operation; the only remaining permanent disturbance would be the physical transmission structure locations. The Basin Electric transmission line relocation construction easement would be 200 feet wide, requiring the same types of construction disturbance areas that would be reclaimed and would require an operational footprint of 5 acres (see Table 2-1). The only remaining permanent disturbance would be the physical transmission structure locations.

2.1.2.5 Access Roads and Crane Paths

For the construction and maintenance of the wind turbines, existing, temporary, and permanent access roads would be used. Existing access roads such as public and private roads would be used to the extent possible. Philip Wind Partners expects to use up to 44 miles of new access roads; however, some existing access roads may require improvements such as adding gravel, widening, or repairing potholes. During construction, the new and improved access roads would be maintained at 40 feet wide for a temporary disturbance total of 117 acres. Following construction, the access roads would be maintained at 16 feet wide for a permanent disturbance total of 80 acres (see Table 2-1). Therefore, 37 acres of land used for access roads would be reclaimed following construction.

In addition to access roads, up to 49 miles of crane paths would be required for construction. The crane paths would be 75 feet wide and only used during construction. Therefore, the 264 acres of temporary disturbance needed for the crane paths would be revegetated following construction. If the soils are firm enough to support the weight of the crane, minimal matting would be placed because the crane would be able to crawl over the land. For reclamation, the compacted soil would be tilled following construction. Philip Wind Partners would also implement the use of pads and crane mats for crane paths on soft soils.

2.1.2.6 Underground Collection Lines

An underground 34.5-kV collector system would be used to route the power from each turbine to the aboveground collector Project substation, which would consist of two main transformers where the electrical voltage would be stepped up from 34.5 to 230 kV. Communication fiber-optic lines would be co-located with the collector system, facilitating direct communication between the turbines and the O&M facility and/or remote-control locations.

Construction of the underground collection lines would temporarily disturb a 40-foot-wide path for approximately 138 miles, or 436 acres (assuming construction of all 95 turbine location options). The collection lines would be buried to a minimum depth of 48 inches with marking tape and tracer wire to meet the appropriate national electrical code. The ground surface above the lines would be revegetated, but no trees would be permitted above the lines. Philip Wind Partners estimates that 700 permanent aboveground junction boxes would be needed, and the total operational disturbance would be less than 1 acre (see Table 2-1).

2.1.2.7 Temporary Meteorological Towers

Approximately five temporary meteorological towers (MET towers) are currently in the proposed Project area. All the towers would be removed as part of Project construction; however, three new permanent free-standing MET towers would be installed as part of the Project activities at new locations shown in Figure 2-1.

The permanent MET towers would be up to 200 feet tall and would be marked and lighted as specified by the Federal Aviation Administration (FAA), and the towers would have FAA-approved aircraft detection lighting systems, if required by the South Dakota Public Utilities Commission (SDPUC).

Construction of the MET towers would temporarily disturb up to 5 acres (a 150-foot radius area per tower). Operation of the MET towers is expected to permanently impact less than 1 acre.

2.1.2.8 Project Life Cycle and Decommissioning

Section 2 of the UGP PEIS describes the activities likely to occur during each of the major phases of a typical wind energy project's life cycle: site testing and monitoring, construction, O&M, and decommissioning. The same project phases, with similar types of activities for each phase, would occur for the Project. The expected life of the Project is approximately 30 years, after which time the Project would either be repowered or decommissioned. Any future decommissioning activities would be completed consistent with the general requirements described in Sections 3.5 – Site Decommissioning, 3.6.4 – Hazardous Materials and Wastes, and 3.6.6 – Transmission Line Decommissioning of the UGP PEIS and applicable federal, state, and local requirements at that time. According to the South Dakota Codified Law § 49-41B 27 (2021), any retrofits and/or upgrades after 30 years would require further approvals from the SDPUC.

2.1.2.9 Environmental Protection Measures

Philip Wind Partners has committed to BMPs based on the resource-specific BMPs identified in the UGP PEIS (see Appendix O) and to the BMPs and species-specific conservation measures identified in the PBA Consistency Evaluation Forms (see Appendix K). In addition to the applicant-committed natural resource setbacks described above (see Table 1-1), Philip Wind Partners has also committed to implementing additional voluntary environmental protection measures to further minimize the Project's impact to the landscape during construction and operations (Table 2-3).

2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, WAPA would not enter into an interconnection agreement with Philip Wind Partners and would not allow the Project to interconnect with the WAPA transmission system, and the new Switchyard would not be constructed. Although this would not preclude the Project from being constructed and connected to a non-WAPA-managed transmission system, for the purposes of analysis, this EA assumes that the Project would not be built. However, WAPA recognizes that Philip Wind Partners would seek an alternative interconnection point for the Project.

For comparison in this EA, the No Action Alternative assumes Philip Wind Partners would not construct the Project.

Table 2-3. Applicant's Additional Voluntary Environmental Protection Measures

Resource	Applicant's Additional Voluntary Environmental Protection Measures
Land use and public facilities	• Coordinate turbine location siting and O&M activities with landowners to minimize interference with farming or livestock operations. This may include agreed-upon turbine locations, maintenance of gates and cattle guards where access roads cross existing fence lines, access control, signing of open range areas, traffic management (e.g., vehicle speed management), and safe operations of agricultural aviation activities.
Geology, soil resources, and paleontology	• Perform soil borings at all wind turbine locations to assist with the specific designs and construction parameters. • Test soil samples to determine the engineering characteristics of the site subgrade soils. • Obtain coverage under the General Permit for Stormwater Discharges Associated with Construction Activities issued by the South Dakota Department of Agriculture and Natural Resources. This permit requires development and implementation of a stormwater pollution prevention plan. The Project's Stormwater Pollution Prevention Plan would be developed during civil engineering design of the Project and would include BMPs to control erosion and sedimentation. • Regularly inspect access roads, utility and transmission line corridors, and structure site areas for damage from erosion, washouts, and rutting. Initiate corrective measures immediately upon evidence of damage. • Correct drainage problems caused by construction to avoid damage to agricultural fields. • De-compact subsoil in temporarily disturbed areas following completion of construction and during decommissioning. • Salvage topsoil from all excavation and construction activities to reapply to disturbed areas once construction is completed. • Remove turbines and ancillary structures from the proposed Project area during decommissioning. Do not bury or leave in place excess concrete in active agricultural areas, excluding belowground portions of decommissioned turbine foundations intentionally left in place. • Place, where possible, ground-disturbing activities and structures in areas that have been previously disturbed through prior human activities. • Based on the presence of Potential Fossil Yield Classification (PFYC) 4 and U (unknown) geological units, a qualified paleontologist would review the final Project design and conduct field reconnaissance of exposures of geological units designated as PFYC 4 and a portion (at least 50% of exposures, e.g., drainage cuts and human-made exposures) of units designated as PFYC U. • If paleontological resources are found in the proposed Project area, their disposition would be in accordance with an agreement between the surface estate owner and the Project proponent.
Wildlife	• Design and construct the Project's aboveground power lines to minimize avian electrocution and collision risks. Guidelines are outlined in APLIC's *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* and *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2006, 2012). • Implement a Bird and Bat Conservation Strategy (BBCS) in accordance with the USFWS's *Land-Based Wind Energy Guidelines* (USFWS 2012) to minimize impacts to avian and bat species during construction and operation of the Project. • Feather turbine blades below the cut-in wind speed of 3 meters per second during the active bat season (April 1–October 31), and below the cut-in wind speed of 5 m per second from 0.5 hour before sunset to 0.5 hour after sunrise during the fall migration period (August 15–October 15). • Train O&M staff to recognize sensitive species as described in the BBCS. Report observations of listed species fatalities to the appropriate state or federal agency within 24 hours of species identification. • Instruct employees, contractors, and site visitors to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. • Use designs for permanent MET towers that do not require guy wires. • Dispose of all garbage or human waste generated on-site promptly to avoid attracting nuisance wildlife.
Hazardous materials and solid waste	• If contamination is caused by or is encountered during on-site construction activity, report the contamination to the South Dakota Department of Agriculture and Natural Resources at (605) 773-3296. Contaminated soil that has been excavated would be segregated from clean soil and sampled to determine disposal requirements. Further, any piping, equipment, or other material to be placed in a location where it will be in contact with contaminated soil or groundwater would be evaluated to determine if it is compatible with the contaminant.

2.3 ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED ANALYSIS

The Applicant and WAPA considered several alternative interconnection location options for interconnection to WAPA's Oahe to New Underwood 230-kV transmission line. One option considered was a line break and construction of a new switchyard approximately 5 miles west of the existing Philip Tap. Interconnection at this location would have required both a new interconnection switchyard and upgrade of the Philip Tap to a switchyard. Construction of two switchyards would be more expensive than one improved switchyard, so WAPA then evaluated alternative locations for placement of a single switchyard to facilitate interconnection to WAPA's Oahe to New Underwood 230-kV transmission line. Three alternative options for removing the existing tap and replacing it with a switchyard were evaluated: 1) a new switchyard south of the existing Philip Tap, 2) the existing Philip Tap location, and 3) the preferred location carried forward for detailed analysis.

New Switchyard South of the Existing Philip Tap: Construction of a new switchyard approximately 1 mile south of the existing Philip Tap Basin Line would have involved building two parallel WAPA lines traversing south for 1.3 miles from the existing tap location and removing 1.3 miles of Basin line. This alternative switchyard location would also require space for the Project gen-tie to access this switchyard site. Access to this site would be from Hilland Road, which is unpaved and not as regularly plowed in the winter as the state highway. This alternative would involve construction of 8.6 miles of new transmission line. Due to the difficulty of routing 1.3 miles of WAPA's lines in parallel to this location and still allowing space for the Project gen-tie and the impracticability of accessing the site from an unpaved road and/or need to construct a new paved road, WAPA determined this was not a reasonable alternative due to the access constraints and increased transmission line length and therefore dismissed it from detailed analysis.

New Switchyard at Existing Philip Tap Location: Constructing a new switchyard adjacent to the north of the existing Philip Tap would minimize the need for approximately 6 miles of new gen-tie lines to be built for the interconnection of the Project. Constructing the switchyard at the approximate location of the existing Philip Tap would also avoid the need to extend the existing Basin Electric transmission line and would reduce the length of the new gen-tie line by approximately 1 mile; however, current road access to the Philip Tap requires travel on 2.7 miles of unpaved road from the paved highway (South Dakota Highway 73). The route from the highway onto unpaved roads traverses private land, passes through a homesite, and crosses a private reservoir's dam. Philip Wind Partners proposed a new route that would avoid the homesite and dam by improving 1 mile of 213th Street and constructing 0.5 mile of a new north-south access road to the current tap location.

This option was eliminated by WAPA because the preferred location of the switchyard is already sited adjacent to the state highway, which would provide better year-round access to the new facility and thereby reduce the need for new road construction. Based on the lack of access to the switchyard from a paved road with year-round maintenance, WAPA determined this was not a reasonable alternative and therefore dismissed it from detailed analysis.

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3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section identifies baseline environmental conditions and analyzes the potential impacts for the Proposed Action and No Action alternative, organized by resource. The Proposed Action section for each resource is separated into potential impacts associated with the Switchyard and those associated with the Wind Facility, to clearly define the impacts associated with each Proposed Action component. This analysis tiers to the analysis conducted in the UGP PEIS, which analyzes the potential direct, indirect, and cumulative environmental impacts of wind energy development across the UGP region and identifies BMPs to avoid or reduce impacts. Therefore, this section incorporates and tiers to the UGP PEIS analysis, focusing on the site-specific information and potential impacts relevant to the Proposed Action.

Each resource section identifies the existing baseline conditions within a specified analysis area. Depending on the resource, the analysis area may be the same as the proposed Project area (see Figure 2-1). Temporary and permanent disturbance acreages are disclosed by facility type in Table 2-1.

Next, each section describes the potential impacts of the Proposed Action to the relevant resource. The analysis also identifies any environmental protection measures (i.e., resource-specific BMPs identified in the UGP PEIS [see Appendix O], BMPs and species-specific conservation measures identified in the PBA Consistency Evaluation Forms [see Appendix K], and the Applicant's additional voluntary environmental protection measures [see Table 2-3]) that would be incorporated into the Proposed Action to avoid, minimize, or mitigate potential impacts.

Each section also has a conclusion that evaluates the impacts of the Proposed Action in terms of context and intensity to determine the significance of the impact. The issue of context considers the geographic, biophysical, and social context in which the effects would occur. The issue of intensity refers to the severity of the impact and is classified in this EA using the following definitions:

- **Negligible:** Resources would be essentially unchanged or unaltered from the Project; these changes would not be detectible and/or measurable beyond normal environmental variability.
- **Minor:** Project would cause a slight change or alteration to specific resources; changes to resources may be detectable and/or measurable; resources as a whole would continue to function as prior to Project.
- **Moderate:** Project would have an appreciable impact on resources that would be obvious; changes to resources would be detectable and/or measurable; resources as a whole may be affected through decreased functionality but would continue to function in a diminished capacity.

Each resource section concludes with a determination of the significance of the impact. One of two conclusions is reached: either the Project would not have a significant impact on the resource considering context and intensity, or the Project would not have a "new" significant impact on the resource compared to what was analyzed in the UGP PEIS to which this EA is tiered. For Project impacts that may be significant, those impacts must have been fully analyzed in the UGP PEIS to reach a finding of no "new" significant impact.

Finally, the sections conclude with a description of the anticipated impact of the No Action Alternative to the resource.

3.1 LAND USE AND PUBLIC FACILITIES

3.1.1 Existing Conditions

3.1.1.1 Land Use

Land use in the proposed Project area was determined by use of the National Land Cover Database (NLCD) (U.S. Geological Survey [USGS] 2019). The proposed Project area and proposed Project features were compared to the NLCD, and areas of overlap were extracted using a geographic information system (GIS). The comparison provides a table of land cover types and allows for determination of temporary and permanent impacts from development of the Proposed Action. The results of this analysis are described below.

Land use in the proposed Project area consists predominantly of herbaceous and planted/cultivated land. Herbaceous land is made up of prairie and grasslands dominated by introduced grasses. Planted/cultivated land is made up of pasture/hayland and cultivated cropland and is referred to as "agricultural" land in this section. Developed land is made up of areas of anthropogenic modification for commercial, residential, and industrial use. This includes buildings, impervious surfaces, and other constructed features. The vegetation associated with developed land is primarily lawn grass and landscaping in association with constructed facilities. Water represents open water such as rivers, ponds, and lakes with less than 1% cover by vegetation or soil. Wetlands include forested and herbaceous vegetation where soil is periodically inundated or saturated. Forest and shrubland are dominated by woody plant species, which cover at least 2% of the land surface. Forest and shrubland land cover types differ in that forest cover is generally greater than 5 m tall, and shrubland cover is less than 5 m tall. Barren land comprises exposed soil, bedrock, sand, talus, strip mines, or gravel pits. Vegetation represents less than 15% of the land surface in the barren land cover type (USGS 2019).

The extent and distribution of land cover types in the proposed Project area are shown in Table 3-1 and Figure 3-1.

Table 3-1. Land Cover Types in the Proposed Project Area

National Land Cover Database Type	Acres	Percentage of Proposed Project Area (%)
Herbaceous	35,491	52%
Agricultural	30,721	45%
Developed	878	1%
Water	616	< 1%
Wetlands	543	< 1%
Forest	54	< 1%
Shrubland	14	< 1%
Barren	4	< 1%
Total	**68,318**	**100%**

Source: USGS (2019).
Note: Sums of values may not add to total value shown, due to rounding.

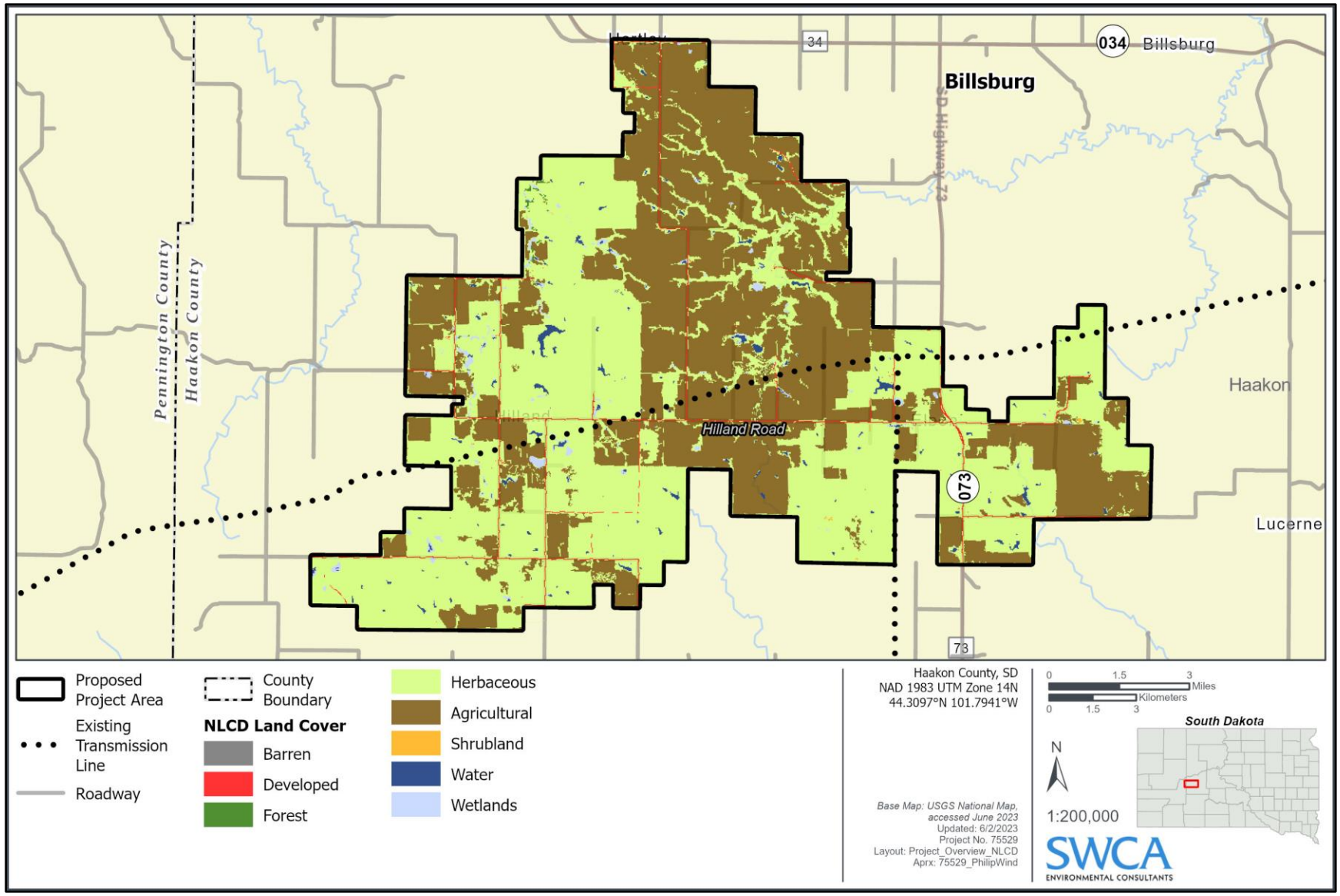

Figure 3-1. National Land Cover Database types in the proposed Project area.

3.1.1.2 Public Facilities

The closest public facilities to the proposed Project area are in the town of Philip, approximately 13 miles south. Within Philip, there is a hospital, police department, fire station, ambulance services, schools, places of worship, parks, and recreational facilities. In the proposed Project area, there is one cemetery; however, all Project infrastructure would avoid the cemetery. There are no places of worship or other public spaces or publicly accessible facilities in the proposed Project area. There are no municipal or commercial airports in the proposed Project area. The closest airport is the Philip Municipal Airport, which is approximately 14 miles south of the proposed Project area. Commercial airports within 100 miles of the proposed Project area consist of Rapid City Regional Airport and Pierre Regional Airport, located 86 miles to the west and 92 miles to the east, respectively. Google Earth aerial imagery shows one possible privately owned landing strip in the proposed Project area, the Ferguson Landing Strip. The landing strip is located near the intersection of 213th Avenue and 215th Street.

One Bureau of Land Management (BLM) inholding lies within the proposed Project area, and three State of South Dakota School and Public land parcels are outside but directly adjacent to the boundary of the proposed Project area. As discussed in Section 5, BLM attended the agency scoping meeting held by Philip Wind in January 2023. Prior to the meeting, Philip Wind provided BLM with a data package of the proposed Project area to help engage BLM in Project consultation. Philip Wind verified that no infrastructure would be cited on the BLM inholding within the proposed Project area.

Primary access to the proposed Project area is via South Dakota Highway 73, which cuts south from South Dakota Highway 34. Secondary points of entry into the proposed Project area off South Dakota Highway 73 are via 213th Street heading west, Hilland Road heading west, Noack Road heading east, and 217th Street heading west. Additional access roads in the proposed Project area that would be used are listed in Table 3-2.

Table 3-2. Existing Access Roads in the Proposed Project Area

Road	Surface Type	Surface Width (feet)
211th Avenue	Gravel or crushed rock	14
211th Street	Gravel or crushed rock	16
213th Street	Gravel or crushed rock	16
215th Avenue	Gravel or crushed rock	22
216th Avenue	Gravel or crushed rock	18
217th Avenue	Gravel or crushed rock	14
217th Street	Primitive	10
218th Avenue	Primitive	10
224th Avenue	Primitive	10
Hilland Road	Gravel or crushed rock	24
Noack Road	Gravel or crushed rock	24
West Fork Road	Gravel or crushed rock	16

Source: South Dakota Department of Transportation (2022).

Along South Dakota Highway 73 and surrounding highways, the average daily traffic volumes in 2021 ranged between 500 and 700 vehicles per day (South Dakota Department of Transportation 2021). In the proposed Project area, existing access roads would be used to the extent possible; however, new access

roads would be required to support construction and maintenance of the Proposed Action infrastructure (see Figure 2-1).

3.1.1.3 Conservation Easements and Protected Lands

There are no USFWS wildlife refuges, USFWS conservation easements, USFWS wetland management district properties, U.S. Department of Agriculture (USDA) Agricultural Conservation Easement Program lands, SDGFP properties, or State of South Dakota School and Public land parcels in the proposed Project area. There is one BLM inholding within the proposed Project area; however, no infrastructure would be sited on the BLM inholding.

3.1.2 Environmental Consequences: Proposed Action

3.1.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. Specific BMPs relating to land use and public facilities include the following (see Appendix O and Table 2-3 for more detail on these BMPs):

- Plan and site wind energy development to minimize impacts to other land uses.
- Coordinate turbine siting with landowners to minimize interference with agricultural production and other land uses.

3.1.2.2 Switchyard

No temporary impacts are expected to occur with the construction and O&M of the Switchyard, as all construction impacts would remain through O&M. The Switchyard would permanently impact less than 1 acre of already developed land and up to 9 acres of herbaceous land. No other land cover types would be impacted by permanent disturbance associated with the Switchyard. No USFWS wetland easements, wildlife refuges, or USDA Agricultural Conservation Easement Program lands would be impacted by permanent disturbance associated with the Switchyard.

3.1.2.3 Wind Facility

Up to 1,291 acres of land would be temporarily disturbed by the construction of the Wind Facility (Table 3-3). This disturbance would take the form of land being used for construction access, construction activities, and staging of equipment and supplies. The existing land cover types that would be temporarily disturbed are agricultural, herbaceous, developed, and wetlands, in descending order. Much of the existing land cover in these areas would be revegetated or returned to the prior land use immediately following construction. Temporary land use for construction is anticipated to last only one or two growing seasons at any given location.

Table 3-3. Wind Facility Disturbances by Land Cover Type

National Land Cover Database Type	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Agricultural	916	73
Herbaceous	360	25
Developed	14	1

National Land Cover Database Type	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Wetlands	< 1	< 1
Water	< 1	< 1
Forest	0	0
Shrubland	0	0
Barren	0	0
Total	**1,291**	**99**

Source: USGS (2019).
Note: Sums of values may not add to total value shown, due to rounding.

Following construction, up to 99 acres of land would be permanently impacted during O&M of the Wind Facility (see Table 3-3). The existing land cover types that would be permanently disturbed are agricultural, herbaceous, developed, and wetlands, in descending order. The remaining 1,192 acres of land would be returned to their existing land cover types following construction. During O&M, agricultural activities could still occur up to the edge of access roads and turbine pads because no fences or gates would surround the access roads and turbine pads, unless installed by the landowner. The collector system would be buried underground and therefore would not permanently affect agricultural activities. The permanently impacted land cover types would be converted into primarily turbine pads and access roads.

Existing access roads may require improvement for construction, which could include adding gravel and repairing potholes. Philip Wind Partners would obtain an appropriate South Dakota Department of Transportation permit for any highway use and a haul route agreement with Haakon County to acquire the appropriate access and use permits to conduct this work and to minimize and mitigate the temporary impacts to area transportation during improvements. New access roads would provide unrestricted and improved access to landowners and livestock based upon the provisions set in their lease agreement and local statutes, thereby resulting in an overall improvement in transportation use.

No impacts to public facilities or publicly accessible facilities are anticipated. No public facilities are in the proposed Project area, apart from public roads. Additionally, no infrastructure would be sited on BLM land within the proposed Project area. The nearest airport is approximately 14 miles from the proposed Project area; therefore, no impacts to airports are anticipated. Philip Wind Partners would follow FAA regulations for marking structures and would implement the necessary safety lighting.

Decommissioning impacts would be the same or fewer than those described for construction. Temporary impacts would occur while land is used for deconstruction and removal of infrastructure. Permanently impacted land would be restored to pre–Wind Facility land use such as agricultural production.

Approximately 1,192 acres of the total 1,291 acres of disturbed land would be returned to their existing land cover types following construction; therefore, impacts to land use would be minor. No impacts to public facilities are expected to occur.

3.1.2.4 Land Use and Public Facilities Conclusion

Of the total 68,318 acres of the proposed Project area, 1,291 acres would be temporarily disturbed by construction of the Project, and up to 108 acres would be permanently disturbed by the Project. The remaining acreage would be returned to its previous land cover and land use. Public roads may require improvements such as new gravel and pothole repair, but no other impacts to public facilities are anticipated. Although there is one BLM inholding in the Project area, this property would not host facilities or project infrastructure. Based on these findings, the disturbance throughout the Project area to

existing land uses and public facilities would be minor. Therefore, the proposed Project's impacts to the current land uses and public facilities would be less than significant.

3.1.3 Environmental Consequences: No Action Alternative

The No Action Alternative would have no direct or indirect impacts to land uses and public facilities, and existing activities would continue.

3.2 GEOLOGY, SOIL, AND PALEONTOLOGICAL RESOURCES

3.2.1 Existing Conditions

Geology, soil, and paleontological resources in the proposed Project area were determined by use of the Mineral Resources Data System (USGS 2023a) and Quaternary Fault and Fold Database for the United States (USGS 2023b), other geological publications cited below, the Web Soil Survey (Natural Resources Conservation Service [NRCS] 2023), and the BLM National PFYC Potential Fossil Yield Classification (PFYC) Geologic Formation 2022 Polygons (BLM 2022a). The proposed Project area and proposed Project features were compared to the reference data, and areas of overlap were extracted using a GIS. The comparison provides a table of mapped resources and features and allows for determination of temporary and permanent impacts from Project development. The results of this analysis are described below.

The physiographic features of the proposed Project area consist of rolling plains, hills, and ridges with shallow meandering drainages. These features formed due to the erosion of softer underlying bedrock through the actions of wind and water along tributaries to Cheyenne and Bad Rivers. Soils in the proposed Project area consist of clay to silty clay textures derived from weathering of underlying shale and siltstone bedrock (National Cooperative Soil Survey 2023). These soils are moderately susceptible to rill erosion and can lose on average 5 tons of soil through water and wind erosion without affecting crop productivity (NRCS 2023). Other soil properties include a low resistance and medium susceptibility to compaction and are moderately well drained (NRCS 2023). The depth to bedrock in the proposed Project area ranges from 50 centimeters to greater than 200 centimeters (NRCS 2023).

Prime farmland and farmland of statewide importance are subject to protection under the Farmland Protection Policy Act (Public Law 97-98; 7 United States Code 4201–4209). Approximately 51% of the proposed Project area is classified as farmland of statewide importance, approximately 42% is classified as not prime farmland, and approximately 7% is classified as prime farmland if irrigated (Table 3-4, Figure 3-2).

Table 3-4. Farmland Types In the Proposed Project Area

Farmland Type	Area (acres)	Percentage of Proposed Project Area (%)
Farmland of statewide importance	34,821	51%
Not prime farmland	28,835	42%
Prime farmland if irrigated	4,662	7%
Total	**68,318**	**100%**

Source: NRCS (2023).

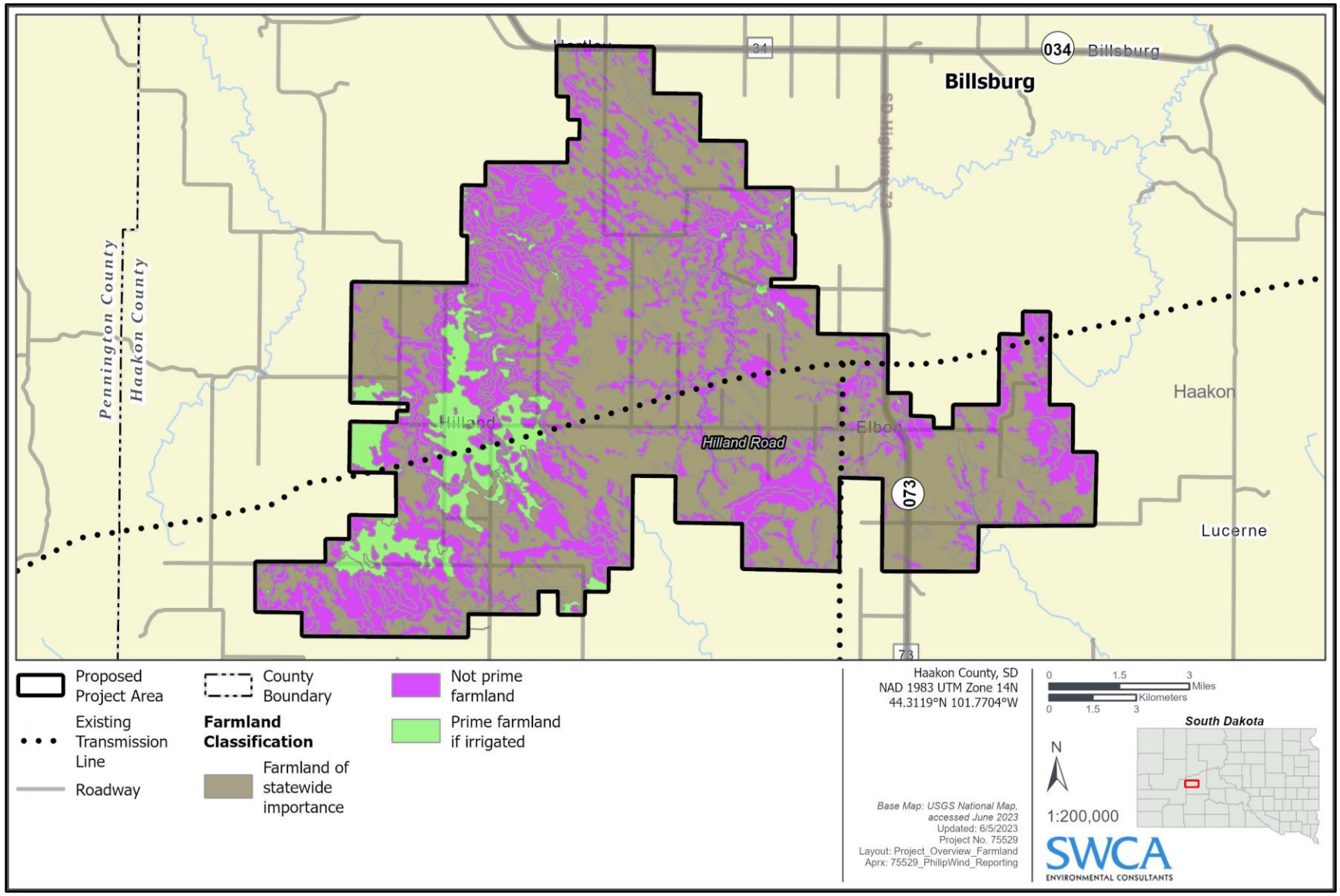

Figure 3-2. Farmland of statewide importance in the proposed Project area.

Commercially viable mineral deposits within Haakon County are limited to sand and gravel. Information from the South Dakota Department of Agriculture and Natural Resources (SDDANR) Minerals and Mining Program and a review of USGS 7.5-minute quadrangles indicates no such deposits have been developed in the proposed Project area. The closest gravel pit to the proposed Project area is approximately 14 miles south (USGS 2023a).

Geological hazards in the proposed Project area may include seismic ground shaking, ground rupture, liquefaction, slope instability, subsidence, expansive soils, and flooding. The seismic risk is low in the proposed Project area, with no known active faults or earthquakes recorded in Haakon County, South Dakota (South Dakota Geological Survey 2023; USGS 2023b). Subsidence risk is considered negligible because the underlying bedrock is not known to develop karst topography or contain layers susceptible to dissolution by water. There are no known reclaimed or underground mining operations in the proposed Project area (USGS 2023a). Landslide incidence is low, but susceptibility is high, which can result in slumping especially along steep slopes, in channel cuts, or during excavations (Radbruch-Hall et al. 1982). No other geological hazards have been reported from the proposed Project area.

The bedrock geology mapped in the proposed Project area mainly consists of dark shales of the shallow marine Pierre Shale and tan to dark-gray sandstones, siltstones, and shale of the marginal marine Fox Hills Sandstone (Martin et al. 2004; Patrick et al. 2002; Waage 1968) (Table 3-5). Bedrock outcrops may exist at the surface in places but are likely to be weathered and eroding into unlithified soils. Other geological units that are present in the proposed Project area make up less than 10% when combined and include Quaternary alluvial and eolian deposits (see Table 3-5).

Previously the BLM assigned each geological unit a PFYC value from 1 (very low) to 5 (very high), or in some cases U (unknown). These values are based on the taxonomic diversity and abundance of previously recorded scientifically important paleontological resources associated with the unit and the potential for future discoveries (BLM 2022b). PFYC U values represent geological units that may exhibit conditions that suggest important paleontological resources could be present but lack information about the presence or absence of these resources in the unit. Guidelines suggest that these units be treated as high to very high (similar to PFYC 4 or 5) until a provisional for formal assignment is made (BLM 2022b).

Paleontological resources are nonrenewable fossilized remains, traces, or imprints of organisms, preserved in or on the Earth's crust, that are of paleontological interest and provide information about the history of life on Earth. BLM PFYC 2022 data and published geological mapping (Martin et al. 2004) indicate that the proposed Project area contains one mapped PFYC 2 geological unit (Quaternary eolian deposits), two mapped PFYC 4 geological units (Pierre Shale and Fox Hills Sandstone), and one mapped PFYC U geological unit (Quaternary alluvium) (BLM 2022a). Table 3-5 summarizes the PFYC value, typical fossils, and acreage for each geological unit in the proposed Project area.

Table 3-5. Geological Units, Potential Fossil Yield Classification, and Typical Fossils

Geological Unit*	Period	PFYC	Typical Fossils	Area (acres)	Percentage of Proposed Project Area (%)
Alluvium	Quaternary	U	Unknown but are possible depending on age and environmental setting of deposits. Holocene-age deposits are too young to contain in situ fossils but may contain the unfossilized remains of modern taxa. Pleistocene-age deposits may contain mineralized or partially mineralized remains (fossils) of mammoths, camels, bison, horses, and rodents.	1,734	3%

Geological Unit*	Period	PFYC	Typical Fossils	Area (acres)	Percentage of Proposed Project Area (%)
Eolian deposits	Quaternary	2	Unlikely but are possible depending on age of deposits. Holocene-age deposits are too young to contain in situ fossils but may contain the unfossilized remains of modern taxa. Pleistocene-age deposits may contain mineralized or partially mineralized remains (fossils) of plants and animals.	4,174	6%
Fox Hills Sandstone	Cretaceous	4	Invertebrates: bivalves, cephalopods, and gastropods; terrestrial and marine vertebrates: fish, sharks, mosasaurs, amphibians, turtles, crocodiles, dinosaurs, birds, and mammals	15,824	23%
Pierre Shale	Cretaceous	4	Invertebrates: bivalves, cephalopods, decapods; vertebrates: fish, sharks, sea turtles, marine reptiles, flying reptiles, dinosaurs, and birds	46,586	68%
Total				**68,318**	**100%**

Source: Martin et al. (2004).

* In descending stratigraphic order (youngest to oldest).

The Pierre Shale and Fox Hills Sandstone each has a long history of geological and paleontological research in western South Dakota and surrounding regions. Locally, the Fox Hills Sandstone contains mostly sandy sequences with some thin zones of coal-bearing beds and gradates rapidly into the underlying Pierre Shale (Waage 1968). In South Dakota and North Dakota, the Fox Hills Sandstone contains numerous fossils, including invertebrates (bivalves, cephalopods, and gastropods) and vertebrates (fish, sharks, rays, marine reptiles, amphibians, turtles, crocodiles, dinosaurs, birds, and mammals) (Case and Martin 2007; Chamberlain et al. 2023; Hoganson et al. 2007; Waage 1968). The Pierre Shale locally comprises black marine shales, mudstone, and claystones and contains numerous fossils mostly representing marine fauna, including invertebrate (bivalves, cephalopods, and decapods) and vertebrates (fish, sharks, sea turtles, and marine reptiles), and on rare occasion terrestrial vertebrates (flying reptiles, dinosaurs, and birds) (Carpenter 1996; Gregory 1948; Ross 2004; Waage 1968; Wieland 1896). Based on the literature review, review of the Paleobiology Database locality data (2023), and results of a previous locality search request received from the South Dakota School of the Mines, no previously recorded localities are in or within 1mile of the proposed Project area. The closest localities contain Pleistocene-age fossils that were documented approximately 9 miles to the northeast and 15 miles to the south (Fox 2023). Even so, paleontological resources are more likely to exist within the PFYC 4 geological units (i.e., Pierre Shale and Fox Hills Sandstone), which are more extensive in the proposed Project area.

SWCA Environmental Consultants (SWCA) conducted a thorough desktop analysis in relation to the proposed infrastructure components that included background research for the analysis area and an aerial imagery review of the Project infrastructure. SWCA used that information and the PFYC ranking of the underlying geological unit to evaluate the paleontological potential of the analysis area and to assess the possibility for construction to disturb known and unknown paleontological resources. SWCA's research included previous paleontological resource reports, geological maps, and literature reviews; previous locality data searches; and discussion with paleontologists conducting active research in the area. The purpose of the analysis of existing data was to 1) determine whether any previously recorded fossil localities are in the Project area, 2) assess the potential for disturbance of these localities during construction, and 3) evaluate the paleontological potential in the Project area. The desktop analysis also included a review of the preliminary geotechnical subsurface boring logs near the proposed wind turbine locations, where construction excavations will be the deepest for foundations. These did not identify the presence of potential fossil-bearing units within the proposed excavation depths. Following the desktop analysis, a paleontologist conducted a field survey to evaluate the analysis area for 1) surface fossils,

2) natural or unnatural exposures of potentially fossiliferous rock, and 3) areas in which future construction would expose, further expose, or otherwise affect potentially fossiliferous rock. The results of this analysis and field survey indicated that there is a low potential of encountering paleontological resources during construction.

Fossils, including paleontological resources, are the property of the surface estate owner. Because the proposed Project infrastructure is located entirely on private land, there are no federal or state laws that require assessment, management of, or protection for paleontological resources other than NEPA. General guidelines and best practices for mitigating paleontology can be found in Murphey et al. (2019). Additionally, BMPs for projects tiering from the PEIS are stated in PEIS Section 5.8.1.6.

3.2.2 Environmental Consequences: Proposed Action

3.2.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. Specific BMPs relating to geology, soil, and paleontological resources include the following (see Appendix O and Table 2-3 for more detail on these BMPs):

- Preserve the health and functioning of soils by minimizing or controlling the ground-disturbing activities.
- Complete regular inspections of disturbed areas or newly reclaimed areas for damage from erosion, washouts, and rutting.
- Correct adverse impacts such as erosion or compaction.
- Plan placement of turbines and access roads to where minimal erosion and geological risks are expected.
- Based on the presence of PFYC 4 and U geological units, a qualified paleontologist would review the final Project design and conduct field reconnaissance of exposures of geological units designated as PFYC 4 and a portion (at least 50% of exposures; e.g., drainage cuts and human-made exposures) of units designated as PFYC U.
- If paleontological resources are found in the proposed Project area, their disposition would be in accordance with an agreement between the surface estate owner and the Project proponent.

3.2.2.2 Switchyard

The main types of impact to soil resources include ground-disturbing activities (grading, trenching, and excavating) that may cause effects such as increased compaction, horizon mixing, erosion and deposition by wind or water, and soil contamination. Such impacts to farmland of statewide importance and prime farmland could reduce the quality, quantity, or productivity of the soils.

Direct impacts to paleontological resources may include breakage, crushing, or displacement of these resources or similar indirect impacts caused from increased erosion of newly exposed sediments and the resources they may contain through ground-disturbing activities such as grading, excavation, or trenching. In addition, increases in human activity during Project activities and from improved access could result in impacts to paleontological resources by increasing the potential for inadvertent or intentional displacement, removal, or breakage of fossils through unauthorized collection or vandalism. The risk for impacts to paleontological resources would be the highest where Project-related ground-disturbing

activities or increased human activity overlap areas mapped as containing PFYC 4 and PFYC U geological units.

The construction and operation of the Switchyard would temporarily and permanently disturb 9 acres of soils, comprising 2 acres of farmland of statewide importance and 7 acres of not prime farmland. Impacts to 9 acres of PFYC 4 Pierre Shale would occur during construction of the Switchyard. In accordance with the UGP PEIS, Philip Wind Partners engaged SWCA to conduct a desktop review and paleontological resource fieldwork in fall 2023. Based on the results of the desktop analysis and field survey, there is a low potential to encounter paleontological resources at or near the surface due to lack of bedrock outcrops across most of the Project area. The overall risk of geological hazards at the Switchyard is low, other than the potential for slumping that exists during excavations.

3.2.2.3 Wind Facility

The types of impacts to geology, soil, and paleontological resources from the Wind Facility would be the same as those described for the Switchyard. The use of heavy equipment would compact soils; however, in areas temporarily disturbed by construction and not needed for O&M, the subsoil would be decompacted where disturbed, and salvaged topsoil would be redistributed.

The construction of the Wind Facility would temporarily impact 1,291 acres (Table 3-6). Of that disturbance, 991 acres would be farmland of statewide importance, 37 acres would be prime farmland if irrigated, and 263 acres would be not prime farmland. Temporary disturbance from the Wind Facility would affect approximately 1,168 acres of the PFYC 4 geological units, 110 acres of the PFYC 2 geological unit, and 12 acres of the PFYC U geological unit.

The Wind Facility would permanently impact 99 acres of soils, of which 79 acres would be farmland of statewide importance, 3 acres would be prime farmland if irrigated, and 17 acres would be not prime farmland. Permanent disturbance from the Wind Facility would impact approximately 90 acres of the PFYC 4 geological units and 9 acres of the PFYC 2 geological unit. The overall risk of geological hazards in the proposed Project area is low, other than potential for slumping that exists along steeper slopes, in channel cuts, and during excavations.

Table 3-6. Wind Facility Disturbances by Farmland Types in the Proposed Project Area

Soil or Paleontological Category	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Farmland of statewide importance	991	79
Not prime farmland	263	17
Prime farmland if irrigated	37	3
Total	**1,291**	**99**

Source: NRCS (2023).
Note: Sums of values may not add to total value shown, due to rounding.

During decommissioning, impacts to soils would be similar to those during construction. Temporary impacts would occur while land is used for deconstruction and removal of infrastructure. Impacts to paleontological resources during decommissioning would include an increase in human activity in the area or any ground-disturbing activities that extend into areas outside the Wind Facility's previous disturbance.

The Wind Facility would temporarily and permanently impact 1,070 acres of the 34,821 total acres of farmland of statewide importance and 40 acres of the 4,662 total acres of prime farmland if irrigated.

Additionally, the Wind Facility would disturb 1,078 acres of the 46,586 total acres of paleontological resource sensitivity (PFYC 4). In accordance with the UGP PEIS, Philip Wind Partners engaged SWCA to conduct a desktop review and paleontological resource fieldwork in fall 2023. Based on the results of the desktop analysis and field survey, there is a low potential to encounter paleontological resources at or near the surface due to lack of bedrock outcrops across most of the Project area. As a result, impacts to geology, soil, and paleontological resources would be minor. Unanticipated discoveries of paleontological resources will be managed in accordance with the UGP PEIS.

3.2.2.4 Geology, Soil, and Paleontological Resources Conclusion

Of the 34,821 acres of farmland of statewide importance in the proposed Project area, up to 991 acres would be temporarily disturbed, and 79 acres would be permanently disturbed. Of the 4,662 acres of prime farmland if irrigated, up to 3 acres would be permanently disturbed. Of the 62,420 acres with PFYC 4 classification, indicating an increased potential for paleontological resources, up to 99 acres would be permanently impacted. To minimize impacts, the Project has committed to voluntary environmental protection measures, such as minimizing erosion and compaction, and hiring a qualified paleontologist to assess the final Project design for paleontological resources. Based on the results of the desktop analysis, preliminary geotechnical boring logs review, and field survey, there is a low potential to encounter paleontological resources at or near the surface due to lack of outcrops across most of the Project area. Therefore, the Project's impact on the geology, soils, and paleontological resources is considered to be minor, and the proposed Project's impacts to such resources would be less than significant.

3.2.3 Environmental Consequences: No Action Alternative

The No Action Alternative would have no direct or indirect impacts to geology, soil, and paleontological resources, and existing activities would continue.

3.3 HYDROLOGIC SETTING AND WATER RESOURCES

3.3.1 Existing Conditions

Hydrologic setting and water resources of the proposed Project Area were determined primarily through desktop analysis of watershed data from the National Map Viewer and Watershed Boundary Dataset (USGS 2023c, 2023d); the mapped waterbodies, including ponds, lakes, streams, and rivers, from the National Hydrography Dataset (NHD) (USGS 2023e); wetlands from the National Wetlands Inventory (NWI) (USFWS 2023a); and groundwater from the Groundwater Atlas of the United States (USGS 1996).

It should be noted that the NHD and NWI databases include some categories that appear redundant with the NLCD database that was used for land cover and land use in Section 3.1, such as open water and wetlands. Discrepancies among different databases are common. The NLCD is used for a coarse assessment of land use and land cover. The NHD and NWI databases are much more sensitive to aquatic features through consideration of topography, soil types, and evidence of inundation and soil saturation. The NHD and NWI databases use different classification systems, and some aquatic features are mapped by both but labelled differently. For example, streams and rivers are mapped as one-dimensional flowlines by the NHD but are mapped as two-dimensional riverine wetlands by the NWI. Under NWI mapping, riverine polygons may include stream channels and associated emergent wetlands adjacent to the channels. For the impact assessment, a linear distance is provided for temporary and permanent impacts to NHD flowlines, whereas an acreage is provided for impacts to NWI polygons.

A site reconnaissance visit was conducted on October 13 and 14, 2022, and NWI and NHD features inconsistent with desktop analysis results were documented if observed while traveling publicly accessible roads. Based on the site visit, the data identified during the desktop analysis overestimated the water resources; several wetland polygons mapped by the NWI and several NHD waterbodies did not appear to be present when viewed from publicly accessible roads. However, the extent of inaccuracy of the NWI data cannot be quantified using these methods. For this reason, the impact assessment relies on the desktop methods while recognizing that estimated impacts are likely overestimated. The Water Resource Analysis Report is provided in Appendix I.

An in-field water resources delineation will be conducted in accordance with U.S. Army Corps of Engineers (USACE) *Corps of Engineers Wetlands Delineation Manual* and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0).* (Environmental Laboratory 1987; USACE 2010) methodologies for the proposed disturbance areas of the proposed Project area. The delineation will determine the location and extent of potentially jurisdictional water features on-site, which will allow for a more refined quantification of water resources and will be used to inform final siting decisions to ensure compliance with applicable Clean Water Act requirements. Following finalization of the Project design, Philip Wind Partners would consult with USACE to obtain any required permits for any impacts to Clean Water Act jurisdictional water resources.

The proposed Project area is located approximately 2,270 to 2,806 feet above mean sea level (USGS 2023c) in the following watersheds: Ash Creek (hydrologic unit code [HUC] 012011204), Bridger Creek (HUC 1012011205), Buzzard Creek-Bad River (HUC 1014010208), Grindstone Creek-Bad River (HUC 1014010206), Harding Creek-Cheyenne River (HUC 1012011206), North Fork Bad River (HUC 1014010204), and West Plum Creek (HUC 1012011208) (USGS 2023d). No Wild and Scenic Rivers are in the proposed Project area (National Wild and Scenic Rivers System 2023). Additionally, no impaired waters listed under Clean Water Act Section 303(d) are in the proposed Project area (U.S. Environmental Protection Agency [EPA] 2015). According to the Federal Emergency Management Agency, a study to determine flood hazards has not been completed for Haakon County (Federal Emergency Management Agency 2021).

A desktop analysis of the watersheds in the proposed Project area was conducted to review the watersheds' existing NHD water resource features; the results are summarized below. In the proposed Project area, there are 1,190 NHD features (USGS 2023e). Stream/River Intermittent accounted for most of the NHD features. Table 3-7 and Figure 3-3 provide NHD features in the proposed Project area. Drainages occurring in the proposed Project area are tributaries to the Cheyenne River and Bad River.

Table 3-7. National Hydrography Dataset Features Mapped in the Proposed Project Area

Water Resource	Count	Length (miles)	Area (acres)
NHD Waterbody			
Stream/River Intermittent	556	325.1	N/A
Artificial Path	278	32	N/A
Lake/Pond	350	N/A	814
Stream/River Perennial	5	20.5	N/A
Swamp/Marsh	1	N/A	4
Total	**1,190**	**377.6**	**818**

Source: USGS (2023e).
Note: N/A = not applicable.

The largest lake in the proposed Project area is Kroetch Lake. This waterbody is classified by the South Dakota Surface Water Quality Standards and Uses Assigned to Lakes for the following beneficial uses: (4) Warmwater permanent fish life propagation waters; (7) Immersion recreation waters; (8) Limited contact recreation waters; and (9) Fish and wildlife propagation, recreation, and stock watering waters (SD DANR 2023).

In the proposed Project area, there are 1,691 mapped NWI features (USFWS 2023a). Freshwater Emergent Wetlands accounts for most area of the NWI features. Table 3-8 and Figure 3-3 represent NWI features in the proposed Project area.

Table 3-8. National Wetlands Inventory Features Mapped in the Proposed Project Area

Water Resource	Count	Area (acres)
NWI Wetlands		
Freshwater Emergent Wetland	480	751
Riverine	973	682
Freshwater Pond	224	333
Freshwater Forested/Shrub Wetland	14	34
Total	**1,691**	**1,800**

Source: USFWS (2023a).

The proposed Project area is located over the regional Northern Great Plains aquifer system (USGS 1996). Permeable rocks of this aquifer system have been grouped into five major aquifers: lower Tertiary, upper Cretaceous, lower Cretaceous, upper Paleozoic, and lower Paleozoic (USGS 1996). Within this aquifer system, water movement occurs from recharge areas at high elevations, down the dip of the aquifers, and then upward to discharge into shallower aquifers or discharge to the land surface. Recharge to this aquifer system is primarily from precipitation or snowmelt. Local recharge includes seepage of excess irrigation water. Discharge from this aquifer system is primarily from upward leakage of water into shallower aquifers where the hydraulic head in a shallower aquifer is less than that of a deeper aquifer. Permeable rocks of this aquifer system have been grouped into five major aquifers, including lower Tertiary, upper Cretaceous, lower Cretaceous, upper Paleozoic, and lower Paleozoic (USGS 1996).

A sole-source aquifer is defined by the EPA as an aquifer that supplies at least 50% of the drinking water for its service area (EPA 2023a). The proposed Project area lies outside of sole-source aquifers (EPA 2023b).

3.3.2 Environmental Consequences: Proposed Action

3.3.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. These measures would reduce long-term erosion and runoff from the disturbance areas, protecting water resources. The impact summaries below consider the water resources–specific BMPs, including the following (see Appendix O and Table 2-3 for more detail on these BMPs):

- Avoid and minimize impacts to water resources to the extent possible through Project layout and design.
- Use appropriate erosion and sediment and spill control measures.
- Remove temporary fills where aquatic features are crossed for construction, restoration, or preconstruction elevations and revegetation (where applicable for nonagricultural use).

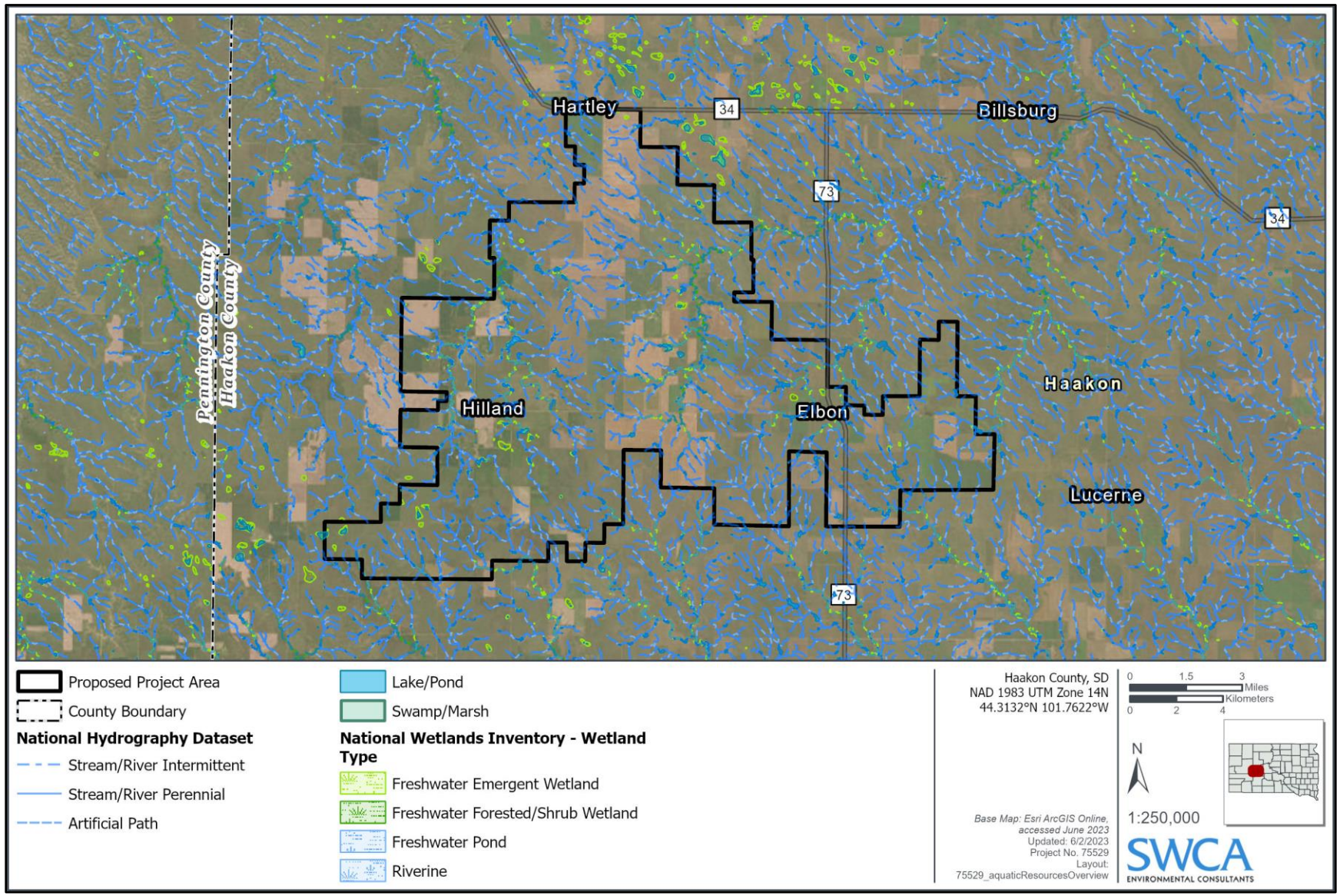

Figure 3-3. National Hydrography Dataset and National Wetlands Inventory features in the proposed Project area.

Note: Width of map symbols for aquatic features are expanded for visibility and are not to scale.

3.3.2.2 Switchyard

The Switchyard would be situated in upland areas with one waterbody (Kroetch Lake) approximately 50 feet from its southwest corner. Philip Wind Partners would use stormwater control measures to limit erosion and sediment transport from the Switchyard site. Therefore, no temporary or permanent impacts to water resources are expected to occur with construction or O&M of the Switchyard.

3.3.2.3 Wind Facility

Estimated impacts to NHD and NWI features are summarized in Tables 3-9 and 3-10. As noted above, NHD and NWI databases track many of the same resources but classify and quantify them in slightly different ways. Therefore, the impacts, as presented in Tables 3-9 and 3-10, are largely redundant. The NHD data in Table 3-9 describe crossings of linear waterbodies as one-dimensional crossings with the length of the features expressed in feet. The NWI data in Table 3-10 describe impacts as two-dimensional construction footprints expressed in acres. Potential impacts to water resources are primarily temporary in nature and relate to construction of collection lines, use as crane paths, construction of transmission lines, and access roads across streams (also classified as riverine wetlands by NWI). For an estimation of impacts, a maximum width was assumed for access and construction work areas (see Table 2-1), although a smaller area may be needed once contractors are deployed on-site.

The dispersed nature of the turbine locations would allow for strategic placement of turbines, access roads, collection lines, and other infrastructure to avoid and minimize impacts to water resources. Both temporary and permanent impact assumptions represent an overestimation of impacts, as noted in Section 2.1. As explained above, in a number of areas, the proposed Project assumes multiple paths for collection to a turbine location to maintain flexibility in siting, but not all collection paths would ultimately be built. The only permanent impacts that may result are from access roads that require stream crossings to access turbine locations.

Impacts to water resources defined through the NHD (i.e., streams or drainages) are listed in Table 3-9 where the number of impact sites identifies the count of water resource features intersected by Project facilities (one site is one stream crossing by a facility), the average length is the length of stream at each site that would be directly disturbed by the Project facility, and the total length of stream is the sum of the length of the individual features impacted. Temporary impacts are estimated to occur at 231 NHD features, with a cumulative linear distance of 16,880 feet (3.2 miles) of NHD flowlines affected. Permanent impacts are estimated at 32 NHD features with a cumulative linear distance of 784 feet (0.2 mile) of NHD flowlines affected.

Impacts to water resources defined through the NWI (i.e., wetlands) are listed in Table 3-10 where the number of impact sites identifies the count of water resource features intersected by Project facilities (one site is one wetland crossing by a facility), the average impact is the area of wetland at each site that would be directly disturbed by the Project facility, and the total area of wetland is the sum of areas of the individual features impacted. For NWI features, these estimates are temporary impacts at 203 individual resources with a cumulative area of 7 acres and permanent impacts at 31 individual resources with a cumulative area of less than 1 acre. Because of the beneficial uses defined for Kroetch Lake, special construction measures may be necessary upslope of that waterbody to maintain the 30-day average total suspended solids criterion of 90 mg/L and the daily maximum total suspended solids criterion of 158 mg/L.

Table 3-9. Wind Facility Impacts to National Hydrography Dataset Features

Feature Type	Infrastructure	Temporary Impacts			Permanent Impacts		
		Number of Impact Sites	Average Length of Stream (feet)	Total Length of Stream (feet)	Number of Sites	Average Length of Stream (feet)	Total Length of Stream (feet)
Stream/River	Access roads	32	60	1,889	32	25	784
	Basin Electric transmission line	4	424	1,697	–	–	–
	Collection lines	133	50	6,643	–	–	–
	Crane paths	36	75	2,629	–	–	–
	Transmission lines	14	184	2,570	–	–	–
	Wind turbines	7	182	1,270	–	–	–
Artificial Flow Path	Access roads	5	36	182	–	–	–
Total		**231**	**N/A**	**16,880**	**32**	**N/A**	**784**

Note: N/A = not applicable.

Table 3-10. Wind Facility Impacts to National Wetlands Inventory Features

Feature Type	Infrastructure	Temporary Impacts			Permanent Impacts		
		Number of Impact Sites	Average Impact (acres)	Total Impact (acres)	Number of Impact Sites	Average Impact (acres)	Total Impact (acres)
Freshwater Emergent Wetland	Access roads	1	< 1	< 1	1	< 1	< 1
	Basin Electric transmission line	2	< 1	< 1	–	–	–
	Collection lines	9	< 1	< 1	–	–	–
	Crane paths	–	–	–	–	–	–
	Transmission lines	5	< 1	< 1	–	–	–
	Wind turbines	–	–	–	–	–	–
Freshwater Forested/Shrub Wetland	Access roads	1	< 1	< 1	1	< 1	< 1
	Basin Electric transmission line	–	–	–	–	–	–
	Collection lines	2	< 1	< 1	–	–	–
	Crane paths	–	–	–	–	–	–
	Transmission lines	1	< 1	< 1	–	–	–
	Wind turbines	–	–	–	–	–	–

Feature Type	Infrastructure	Temporary Impacts			Permanent Impacts		
		Number of Impact Sites	Average Impact (acres)	Total Impact (acres)	Number of Impact Sites	Average Impact (acres)	Total Impact (acres)
Riverine	Access roads	29	< 1	< 1	29	< 1	< 1
	Basin Electric transmission line	1	< 1	< 1	–	–	–
	Collection lines	101	< 1	3	–	–	–
	Crane paths	34	< 1	1	–	–	–
	Transmission lines	10	< 1	< 1	–	–	–
	Wind turbines	7	< 1	< 1	–	–	–
Total		**203**	**N/A**	**7**	**31**	**N/A**	**< 1**

Where streams are crossed for access roads, a wider access road width is assumed for construction access (40 feet on average) than for permanent O&M access (16 feet on average), consistent with Table 2-1. Whether water resources are defined by NHD or NWI databases, permanent impacts represent less than 5% of the stream length or wetland area of temporary impacts (i.e., 95% of the temporary impacts would be reclaimed).

An in-field water resources delineation would be performed prior to construction in accordance with the methodologies provided above to determine the precise location of potential waters of the U.S. and used to determine temporary and permanent impacts (and the spatial extent of any such impacts). Any impacts to waters of the U.S. would be permitted in compliance with the Clean Water Act.

No impacts to the Northern Great Plains aquifer system are projected. If dewatering were required for construction of turbine foundations, the dewatering would be temporary and of limited spatial extent. Following construction dewatering, groundwater levels would be anticipated to return to preconstruction conditions.

Decommissioning impacts would be the same or fewer than those described for construction. Temporary impacts would occur while streams and wetlands are crossed for deconstruction and removal of infrastructure; however, current practices for decommissioning would not use large cranes for disassembly, and therefore would not require the disturbance of crane paths. Permanently impacted land would be restored to pre–Wind Facility land use such as agricultural production.

Philip Wind Partners would minimize ground disturbance and control stormwater through runoff and erosion and sediment control measures. The average disturbance at wetlands and waterbodies would be less than 0.1 acre during construction at 231 crossings according to NHD and 203 crossings according to NWI; all but 32 streams (according to NHD) or 29 riverine (drainage channel crossings) and 2 wetland crossings (according to NWI) would be returned to preconstruction conditions after completion of construction. The only permanent impacts to water resources that may occur are crossings of streams for access roads, which would be a total of less than 1 acre. As a result, impacts to hydrologic setting and water resources would be negligible.

3.3.2.4 Hydrologic Setting and Water Resources Conclusion

Of the total 378 miles of identified waterways in the proposed Project area, up to 0.15 mile would be permanently impacted, and up to 3.2 miles would be temporarily impacted. Of the 1,800 acres of wetlands

within the proposed Project area, less than 1 acre would be permanently impacted, and up to 7 acres would be temporarily impacted by the proposed Project. These impacts would be dispersed throughout the proposed Project area. The Project also committed to BMPs that include using erosion and sediment controls and restoring areas that would be impacted temporarily during construction. Any impacts to water features potentially under the jurisdiction of the state or USACE would also be permitted as required. Therefore, the proposed Project's impacts to the hydrologic setting and water resources would be negligible and considered less than significant.

3.3.3 Environmental Consequences: No Action Alternative

The No Action Alternative would have no direct or indirect impacts to hydrology or water resources and existing activities would continue.

3.4 AIR QUALITY AND CLIMATE

3.4.1 Existing Conditions

The Clean Air Act requires the EPA to set National Ambient Air Quality Standards for six criteria air pollutants: carbon monoxide, lead, ground-level ozone, nitrogen dioxide, particulate matter (PM), and sulfur dioxide (EPA 2022a). Volatile organic compounds (VOCs) are also regulated by the EPA due to their ability to participate in photochemical reactions that form ozone, and VOCs are often components of petroleum fuels, hydraulic fluids, paint thinners, and dry-cleaning agents.

The EPA tracks the emissions of greenhouse gases (GHG). GHGs are gases that trap heat in the atmosphere and include carbon dioxide (CO_2), methane, nitrous oxide, and fluorinated gases. In 2020, CO_2 made up most of the GHG at 79% (EPA 2022b). GHGs enter the atmosphere through burning fossil fuels, solid waste, trees, and other biological material. GHGs also are released through the production and transport of coal, natural gas, and oil, and from livestock and other agricultural uses (EPA 2022b).

Hazardous air pollutants (HAPs) are monitored by the EPA and are known to cause cancer, damage to the immune system, and other serious health problems (EPA 2023c). The Clean Air Act requires the EPA to regulate 188 toxic air pollutants such as benzene, which is found in gasoline and mercury, and which can also deposit from the air into soils or surface waters (EPA 2023c).

The primary emission sources close to the proposed Project area are agriculture equipment and emissions from vehicles driving on South Dakota Highway 73. The nearest ambient air quality monitoring site is the Badlands of South Dakota, located 45 miles southwest of the proposed Project area. At this site, particulate matter (PM), sulfur dioxide, nitrogen dioxide, and ozone levels are tested. The Badlands site monitors the daily levels of PM with a diameter of 10 microns or less (PM_{10}), PM with a diameter of 2.5 microns or less ($PM_{2.5}$), sulfur dioxide, nitrogen dioxide, and ozone (Dakota Department of Environmental and Natural Resources 2020). According to the *South Dakota Ambient Air Monitoring Network 5-Year Assessment of Air Monitoring Sites*, the trend for PM_{10} annual average shows decreasing concentrations, and the trend for $PM_{2.5}$ shows slightly increasing concentrations. $PM_{2.5}$ usually comes from fuel combustion and burning activities (SDDANR 2020). PM_{10} usually comes from roads, construction projects, and farm tillage. For sulfur dioxide, the trend for the yearly 99th percentile, 1-hour concentrations during the 5 years (2014–2019) shows increasing concentrations (Dakota Department of Environmental and Natural Resources 2020). The trend for nitrogen dioxides average annual concentrations has been steady. Lastly, the trend for ozone 8-hour daily maximum concentrations during the 5-year segment shows slightly increasing levels.

In January 2023, the Council on Environmental Quality (CEQ) issued interim guidance regarding the treatment of GHG emissions and climate change under NEPA. The guidance reports that the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change, has determined that rising atmospheric concentrations of greenhouse gases are causing corresponding increases in average global temperatures and in the frequency and severity of natural disasters including storms, flooding, and wildfires (IPCC 2022). By extension, any net change in GHG emissions brought about by a proposed project would affect atmospheric concentrations of GHGs and so act to exacerbate or mitigate future climate changes.

As such, CEQs (2023) interim guidance recommends that NEPA documents provide estimates of a project's GHG emissions over the expected lifetime of the project and that those emissions be put in context using the social cost of GHG emissions to express the monetary cost or benefit of the Project-related change in GHG emissions. This assessment was implemented to comply with CEQ's 2023 interim guidance regarding the consideration of GHG and climate change in the NEPA context.

The air quality analysis below was conducted for the Project using the EPA's Motor Vehicle Emission Simulator model (MOVES3**)**. The MOVES3 model is a state-of-the-science emission modeling system that estimates emissions for mobile sources at the national, county, and project level for criteria air pollutants, GHGs, and air toxics (EPA 2022c). For this Project, the primary GHG emissions of concern are CO_2, methane, and nitrogen dioxide and sulfur hexafluoride (SF_6), which have been analyzed using the MOVES3 model.

Emissions of CO_2 lead to long-lasting increases in atmospheric concentrations, persisting for thousands of years, whereas methane typically remains in the atmosphere for approximately 20 years on average, and nitrous oxide for approximately 100 years on average (EPA 2023d). Therefore, the results of the GHG emissions from the Project are displayed in a 20-year and 100-year timeframe because the global warming potential of CO2, methane, and nitrogen dioxide changes over time. Emissions have been also separated into three time periods: direct emissions associated with project construction are assumed to occur in 2025; direct emissions associated with project operation are assumed to occur from 2026 through 2055; direction emissions associated with project decommissioning are assumed to occur in 2056.

Wind energy generation provides air quality and public health benefits as it reduces the emission of greenhouse gases and the reliance on fossil fuel energy. According to the International Energy Agency, the United States' greenhouse emissions grew by 0.8%, or 36 metric tons of CO_2, in 2022. (International Energy Agency 2023.) This rise was driven by the increased use of natural gas. However, wind energy generation in 2022 reduced the demand of fossil fuel energy. In 2022, the United States' power sector emissions decreased by 20 metric tons of CO_2, in large part due an increase in renewable energy generation. Without 2022's rise in renewable generation, power sector emissions would have been approximately 65 metric tons of CO_2 or higher (International Energy Agency 2023).

3.4.2 Environmental Consequences: Proposed Action

3.4.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O). The impact summaries below consider air quality–specific BMPs, including the following (see Appendix O for more detail on these BMPs):

- Use surface access roads, on-site roads, and parking lots with aggregates or that maintain compacted soil conditions to reduce dust generation.

- Water unpaved roads, disturbed areas (e.g., scraping, excavation, backfilling, grading, and compacting), and loose materials generated during Project activities as necessary to minimize fugitive dust generation.
- Install wind fences around disturbed areas if windborne dust is likely to impact sensitive areas beyond the site boundaries (e.g., nearby residences).

3.4.2.2 Switchyard

Table 3-11 represents the typical types of equipment that would be used for the Switchyard construction period alone. These estimates are conservative (erring on the side of too much equipment) based on construction of general wind projects of this size. The associated air quality impacts have been analyzed in combination with the Wind Facility in Section 3.4.2.3.

Table 3-11. Switchyard Construction Equipment List

Type of Equipment	Number of Units
Bulldozer	1
Compactor	1
Concrete truck	2
Crane	1
Excavator	1
Grader	1
Haul truck	1
Passenger truck (workers commuting)	10
Semi delivery truck	2
Telehandler	1

Air quality may temporarily be impacted by O&M of the Switchyard through fugitive dust created from soil disturbances and engine exhaust from vehicles and equipment used. Fugitive dust, measured in the form of PM_{10}, from increased vehicle traffic on dirt roads has a higher impact to ambient air quality than machinery engine exhaust, which is measured as $PM_{2.5}$.

The operation period of the Switchyard would not directly result in air emissions. Operation associated with the transmission line would produce very small amounts of VOCs, GHGs, and HAPs during periodic inspection and maintenance. During operation, emissions would include fugitive dust and engine exhaust from vehicles during regular Switchyard site inspections, infrequent maintenance activities, and wind erosion from access roads. Negligible VOC emissions could be released during routine maintenance activities such as applying lubricants, cooling fluids, and greases. In addition, combustion-related emissions could be released when using diesel emergency generators during routine preventative maintenance. Collectively, emissions from dust, vehicles exhaust, and combustion-related emissions would not exceed air quality standards nor negatively impact climate change (WAPA and USFWS 2015).

Decommissioning activities, including dismantling the Switchyard and associated structures, would mimic construction activities, but would be on a smaller scale and for a shorter duration. Potential emissions impacting ambient air quality would be temporary, minor, and less than for construction, and the same mitigation measures would be applied during decommissioning.

3.4.2.3 Wind Facility

Table 3-12 contains the typical construction equipment that would be used for the Wind Facility. These estimates are conservative (erring on the side of too much equipment) based on construction of general wind projects of this size.

Table 3-12. Wind Facility Construction Equipment List

Type of Equipment	Number of Units
Belt truck	2
Boring drill	2
Bucket truck	5–6
Bulldozer	8
Cable truck/trailer	2
Compactor	8
Concrete truck	10–30
Crane	9–12
Dump truck	8
Excavator	8
Generator	5
Grader	3
Haul truck	5
Heavy haul truck	10
Helicopter	–
Boom lift	3–6
Passenger truck (workers commuting)	40
Semi delivery truck	20
Street sweeper	1
Telehandler	12–15
Trencher	2
Water truck	3

Using the MOVES3 tool and the equipment information in Table 3-11 and Table 3-12, the total global warming potential from Project construction was calculated. Approximately 23,883 metric tons of CO2 equivalent (CO2e mt) would be emitted during a 20-year period, and 23,845 CO2e mt would be emitted during a 100-year period.

Project construction could also release air emissions of criteria pollutants, VOCs, GHGs, CO2, and small amounts of HAPs. Because the proposed Project area is in a rural area, nearby residences would be temporarily exposed to pollutants; however, the impacts to air concentration levels would be negligible. Air quality may temporarily be impacted by O&M of the Wind Facility through fugitive dust from soil disturbances due to wind erosion and from engine exhaust due to routine maintenance. In addition, an increase in levels of PM2.5 could occur from burning fuel emitted by vehicles. Table 3-13 represents the Project operation off-road equipment that would be used.

Table 3-13. Project Operation Equipment List

Type of Equipment	Number of Units
Crane	1
Generator	5
Helicopter	1
Passenger truck (workers commuting)	10
Utility truck	5

The estimated annual emissions emitted from the operation of the Project is 275 CO2e mt. Therefore, if the Project operates for 30 years, approximately 8,250 of CO2e mt would be omitted annually.

During O&M, fugitive dust from increased vehicle traffic on dirt roads would have a higher impact to ambient air quality than fugitive dust from vehicle or machinery engine exhaust. Additional emissions would include 1) negligible VOC emissions during routine maintenance activities such as applying lubricants, cooling fluids, and greases, and 2) a small amount of combustion-related emissions using diesel emergency generators during routine preventative maintenance. Collectively, emissions from dust, vehicles exhaust, and combustion-related emissions would not exceed air quality standards nor negatively impact climate change (WAPA and USFWS 2015).

Table 3-14 represents the type of equipment to be expected during Project decommissioning.

Table 3-14. Project Decommissioning Equipment List

Type of Equipment	Number of Units
Bulldozer	6
Compaction equipment	4
Crawler crane	1
Dump truck	5
Grader	5
Loader/backhoe	5
Boom lift	2
Passenger truck (workers commuting)	10
Rough terrain crane	4
Utility truck	7
Wire puller	2

Decommissioning activities would include dismantling the wind turbines and would mimic construction activities. Approximately 10,874 CO2e mt would be emitted during decommissioning over a 20-year period, and approximately 10,860 CO2e mt over a 100-year period. The decommissioning period, however, is shorter and on a smaller scale that the construction period; therefore, the emission impacts are 46% less than the construction period. Potential emissions impacting ambient air quality would be minor, temporary, and have less impact than for construction, and the same mitigation measures would be applied during the decommissioning period.

The gross total lifetime emissions for the construction, operation, and decommissioning of the Project would result in approximately 43,000 CO_2e mt over a 20-year period and 42,945 CO_2e mt over a 100-year period. The CEQ's January 2023 Interim NEPA Guidance on Greenhouse Gas Emissions states that agencies should quantify proposed actions' net greenhouse gas emissions relative to baseline. That is, agencies should consider whether an action is likely to result in an increase or a decrease in global greenhouse gas emissions. This is done by considering direct emissions, indirect emissions, and any gross emissions reductions brought about by the proposed action. This calculation is explicitly intended to include the potential displacement of, in this case, electricity produced at a higher GHG emission intensity.

Assuming a capacity factor of 39% (DOE 2022), a 300 MW wind facility tied to the existing Oahe to New Underwood 230-kV transmission line would generate 1,024,920 MWh annually and place that electricity into the U.S. Energy Information Administration's Central electric generation region. Fell and Johnson used historical data to estimate that adding a MWh of wind generation in the Central region offset GHG emission by about 0.535 CO_2e mt (Fell and Johnson 2021). Multiplying these two estimates, an annual GHG offset of approximately 548,000 metric tons CO_2e would be anticipated during each year of operation. Philip Wind Partners has estimated a greater capacity factor of 46 to 49% based on on-site wind data and turbine models being considered; this would increase the power generated (1,2887,720 MWh), and thus increase the GHG offset to 689,000 CO_2e.

Wind energy facilities offset considerable amounts of criteria pollutants during O&M, including VOC and HAP emissions that would have been generated from power plants using nonrenewable and highly polluting fossil fuels. Operation of a wind energy facility avoids between 153,834 and 923,604 tons of CO2 per year, assuming the facility would displace fossil fuel sources (WAPA and USFWS 2015). Using the EPA's Avoided Emissions and Generation Tool (AVERT), a 300-MW wind facility in the Rocky Mountains region (Haakon County, South Dakota, included) would displace 851 gigawatt-hours of regional fossil fuel generation over the course of a year (AVERT 2023d). With a facility of this size, an expected 737,280 pounds of CO_2, 23,280 pounds of VOCs, 24,790 pounds of PM2.5, and 715,950 pounds of nitrogen oxide would be avoided by a wind facility replacing that amount of power generated from fossil fuel plants (EPA 2023e).

The Fourth National Climate Assessment found that human-related emissions of GHGs cause extreme climate events, negatively impacting human safety, infrastructure, agriculture, water quality and quantity, and natural ecosystems (Wuebbles et al. 2017). The implementation of wind energy facilities does not emit significant GHG emissions, unlike similar sized fossil fuel facilities. Air quality effects caused by the construction, operation, and decommissioning of wind energy facilities would be short term and would not result in National Ambient Air Quality Standards exceedance or contribute to a notable change in GHGs (WAPA and USFWS 2015).

The Project would result in a net decrease of 16 million CO_2e mt emitted into the atmosphere. The value of this benefit, expressed in 2023 dollars using a 3% annual discount rate, is estimated to be $846 million.

3.4.2.4 Air Quality and Climate Conclusion

Gross total lifetime emissions for the construction, operation, and decommissioning of the Project would result in approximately 43,000 CO2e mt, which would be offset by the net 16 million CO2e mt reduction in CO2e because of the Project. Therefore, the overall impact of the Project would be beneficial to air quality and climate. Based on this analysis, the proposed Project's impacts would be beneficial, and any adverse effects would be negligible. Therefore, the proposed Project's impacts to air quality and climate would be less than significant.

3.4.3 Environmental Consequences: No Action Alternative

Under the No Action Alternative, the Project would not be developed, existing activities would continue, and impacts to air quality would continue at current trends. Offsets to GHG emissions gained from operations of the Project would not be realized.

3.5 NOISE

3.5.1 Existing Conditions

Section 4.5 – Acoustic Environment of the UGP PEIS discusses the existing acoustic environment in the UGP region and describes the sound pressure level as a logarithmic ratio of the measured value to a reference level or "decibel" (dB). The UGP PEIS notes that audible sounds range from 0 dB ("threshold of hearing") to approximately 140 dB ("threshold of pain"). The UGP region noise level estimates are relatively low due to the proposed Project area's location within a rural and underdeveloped area, with levels ranging from 33 to 47 A-weighted dB (dBA) (Section 4.5.1.5 – Background Noise Levels in the UGP Region of the UGP PEIS).

The proposed Project area is located in rural Haakon County and consists of cropland, pastureland, grasslands, and scattered rural residences. This area is a windy region; therefore, wind is a natural contributor to noise in the area. Other contributing factors to noise in the proposed Project area include farming activities and occasional vehicular traffic. Currently, there are no noise-related federal, county, or local regulations that apply to the Project.

A preconstruction wind turbine noise analysis, which analyzed noise associated with the proposed Project, was conducted in April 2023 (see Appendix A for the Preconstruction Wind Turbine Noise Analysis report). The analysis found that other projects have used county limits of 45 dBA at nonparticipating residences and local limits of 50 dBA. The range of 45 to 50 dBA is consistent with the limits applied to wind turbine projects nationally. The proposed Project has been designed to meet the goal of a 48-dBA limit.

3.5.2 Environmental Consequences: Proposed Action

3.5.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. The impact summaries below consider the noise-specific BMPs, including the following (see Appendix O and Table 2-3 for more detail on these BMPs):

- Establish sufficient setback distances from sensitive receptors wherever feasible. Based on previous experience, noise complaints seldom exist for people living more than 1 to 1.5 miles (1.6–2.4 kilometers) from a wind farm (Stewart 2006).
- Schedule noisy activities to occur at the same time whenever feasible, because additional sources of noise generally do not greatly increase noise levels at the site boundary.

3.5.2.2 Switchyard

Construction of the Switchyard is anticipated to take up to 1 year to complete. Section 5.5.1.2 – Noise Impacts of the UGP PEIS indicates that combined noise levels for typical construction equipment likely

used at a wind turbine project site are approximately 90 dBA at 50 feet, and the noise level at approximately 0.75 mile is approximately 40 dBA, which would be typical of the daytime rural background level. The nearest noise receptor to the Switchyard is a nonparticipating residence, which is approximately 0.5 mile away. However, the noise levels associated with the construction of the Switchyard would be temporary in nature and would occur during the daytime when background noises tend to be higher.

The Switchyard would temporarily impact noise in a relatively small portion of the entire proposed Project area. Noise generated during construction of the Switchyard in the proposed Project area would return to preconstruction noise levels, except for occasional sources of sound due to regular Switchyard site inspections and the infrequent vehicular visits for routine maintenance. As a result, the noise impacts from the construction and operation of the Switchyard would be minor.

Decommissioning noise impacts are anticipated to be the same or less than those described for construction. Temporary noise impacts would occur while deconstruction and removal of infrastructure are in progress.

3.5.2.3 Wind Facility

Construction of the Wind Facility is anticipated to take up to 2 years to complete. During construction, noise levels would increase temporarily in the proposed Project area due to the use of construction equipment. The noise level generated by construction equipment would vary depending on the type of work to be accomplished. Section 5.5.1.2 – Noise Impacts of the UGP PEIS indicates that combined noise levels for typical construction equipment likely used at a wind turbine project site are approximately 90 dBA at 50 feet, and the noise level at approximately 0.75 mile is approximately 40 dBA, which would be typical of the daytime rural background level.

Construction of wind turbines at any one location would occur for a few days before moving to other wind turbine locations. Therefore, construction sound would vary throughout the overall proposed Project area. Construction would also mostly occur during the day when background noises tend to be higher. It is possible that some construction activities would carry through the night, but such activities would be infrequent and would depend on weather and timing of a concrete pour, which must be continuous.

During operation of the Wind Facility, the wind turbines and substation would be a permanent source of sound, whereas the 230-kV gen-tie line would be representative of noise typical to that of background sound levels in a rural environment. The Preconstruction Wind Turbine Noise Analysis predicts noise levels for the full, continuous, and normal operation of the proposed facility at the 24 nonparticipating and 13 participating residences near the Wind Facility (see Table 5-1 in Appendix A) using the loudest turbine model under consideration, the Vestas V163-4.5 with standard blades. The analysis found that the highest predicted noise level at a nonparticipating residence is 44.7 dBA, which is less than the 48-dBA noise level goal. However, predicted noise levels at all participating residences could be up to 48 dBA if Philip Wind Partners uses the loudest turbine model under consideration, the Vestas V163-4.5 with standard blades. To provide a visual demonstration of compliance, the predicted noise levels are shown in the form of noise level contours for the loudest turbine model (Vestas V163-4.5 with standard blades) in Figures 5-1 to 5-3 of Appendix A.

Noise levels reported in the noise analysis are the highest turbine noise levels expected because they represent the case where all turbines are operating at full capacity; lower noise levels are expected when the turbines are not producing full acoustic output due to low winds and/or when atmospheric conditions are not being conducive to sound propagation, as assumed by the acoustic models (see Appendix A). See

Appendix A for predicted noise levels contours and source sound power levels in the proposed Project area.

The underground collection lines would not be a permanent source of sound, whereas the O&M facility would be an occasional source of sound due to the infrequent operation of the diesel generator and other vehicles and/or equipment.

The Wind Facility would temporarily and permanently impact noise levels in the proposed Project area. Increased noise levels in the proposed Project area from construction would be transient across the proposed Project area as construction progressed and would be temporary. Noise levels during operation of the wind turbines would remain below 48 dBA, which is within the range of a rural and underdeveloped area as described in Section 3.5.1. As a result, impacts to noise in the proposed Project area would be negligible to minor.

Decommissioning noise impacts are anticipated to be the same or less than those described for construction. Temporary noise impacts would occur while deconstruction and removal of infrastructure are in progress.

3.5.2.4 Noise Conclusion

The UGP PEIS states that background noise levels in rural and undeveloped areas in the UGP region range from 33 to 47 dBA (see Section 4.5.1.5 – Background Noise Levels in the UGP Region of the UGP PEIS). Haakon County is a rural area that is presumed to fall within that range.

The Project's maximum operational noise level, which assumes that all 95 turbines are operating at the same time, would be 48 dBA (see Appendix A). This 1-dB difference in sound between background noise and maximum operational noise levels is negligible and insignificant, because the UGP PEIS determined this difference is "not perceptible" (Section 4.5.1.1 – Fundamentals of Acoustics of the UGP PEIS). Therefore, the proposed Project's impacts to noise during operation are consistent with the analysis in the UGP PEIS and would not result in new or more severe significant impacts than described in the UGP PEIS.

With respect to construction noise, the UGP PEIS states that most construction equipment would have noise levels ranging from 75 to 90 dBA and that combined noise levels for typical construction equipment are about 90 dBA at a distance of 50 feet (Section 5.5.1.2 – Construction of the UGP PEIS). Because this Project has noise levels from construction equipment approaching 90 dBA, it fits within the UGP PEIS's anticipated range. Furthermore, the UGP PEIS states that construction noise levels at 0.75 mile would be about 40 dBA, which is typical of the daytime rural background levels (see Section 5.5.1.2 of the UGP PEIS). However, even if there are sensitive receptors, the UGP PEIS provides BMPs and mitigation measures that are applicable to this issue (e.g., limiting construction activities to times when nearby sensitive receptors are least likely to be disturbed [Section 5.5.2 – BMPs and Mitigation Measures of the UGP PEIS]). Therefore, the proposed Project's impacts to noise during construction are consistent with the analysis in the UGP PEIS and would not result in new or more severe significant impacts than described in the UGP PEIS.

3.5.3 Environmental Consequences: No Action Alternative

The No Action Alternative would have no direct or indirect impacts to noise, and existing activities would continue.

3.6 VEGETATION

3.6.1 Existing Conditions

The dominant vegetation type in the proposed Project area is Northwestern Great Plains Mixedgrass Prairie, a vegetation type that is common to the region and makes up 25,856 acres of the proposed Project area (LANDFIRE 2023) (Table 3-15). This system is one of the most disturbed grassland systems in South Dakota (LANDFIRE 2023). The Western Cool Temperate Wheat and Western Cool Temperate Row Crop vegetation types make up a combined 22,951 acres of the proposed Project area. Sections of wetlands, deciduous forests, and shrublands are very limited around the proposed Project area (Figure 3-4; see Figure 3-1). The vegetation data differ from the land use/land cover data in Section 3.1 because results were derived from two databases that use different methods and classification systems. The LANDFIRE database used for vegetation in this section represents a more detailed and nuanced classification of land cover than the NLCD used in the previous section. The dominant land cover types of Section 3.1 are herbaceous and agricultural, but those categories are split into at least a dozen subtypes (i.e., vegetation types) in Table 3-15. For purposes of a coarse description of land use, the NLCD is appropriate. For more detailed description and impact analysis of vegetation, the LANDFIRE database is a better data source.

Table 3-15. Vegetation Types in the Proposed Project Area

LANDFIRE Database Vegetation Type	Acres	Percentage of Proposed Project Area (%)
Northwestern Great Plains Mixedgrass Prairie	25,856	38%
Western Cool Temperate Row Crop	13,436	20%
Western Cool Temperate Wheat	9,515	14%
Western Cool Temperate Pasture and Hayland	5,246	7.8%
Western Cool Temperate Fallow/Idle Cropland	3,042	5.5%
Western Cool Temperate Row Crop – Close Grown Crop	2,750	4.1%
Western Cool Temperate Close Grown Crop	2,359	3.5%
Northwestern Great Plains Riparian Herbaceous	2,320	3.4%
Northern and Central Plains Ruderal and Planted Grassland	1,411	2.1%
Developed-Roads	851	1.4%
Western Cool Temperate Urban Herbaceous	688	< 1%
Open Water	537	< 1%
Western Great Plains Closed Depression Wetland	147	< 1%
Western Cool Temperate Urban Shrubland	75	< 1%
Western Cool Temperate Developed Herbaceous	21	< 1%
Developed-Low Intensity	16	< 1%
Western Great Plains Tallgrass Prairie	10	< 1%
Great Plains Wooded Draw and Ravine Woodland	7	< 1%
Northwestern Great Plains Shrubland	7	< 1%
Western Cool Temperate Urban Deciduous Forest	7	< 1%
Developed-Medium Intensity	6	< 1%

LANDFIRE Database Vegetation Type	Acres	Percentage of Proposed Project Area (%)
Northwestern Great Plains Riparian Forest	3	< 1%
Western Cool Temperate Urban Mixed Forest	3	< 1%
Western Great Plains Badlands	2	< 1%
Northern and Central Plains Ruderal and Planted Shrubland	1	< 1%
Northwestern Great Plains Riparian Shrubland	1	< 1%
Western Cool Temperate Urban Evergreen Forest	1	< 1%
Developed-High Intensity	< 1	< 1%
Northwestern Great Plains-Black Hills Ponderosa Pine Woodland and Savanna	< 1	< 1%
Western Great Plains Open Freshwater Depression Wetland	< 1	< 1%
Total	**68,318**	**100%**

Source: NRCS (2023).
Note: Sums of values may not add to total value shown, due to rounding.

3.6.1.1 Grasslands

A grassland habitat assessment was conducted in and around the proposed Project area to identify parcels of grassland and to identify sod types as unbroken or broken. Undisturbed grassland was defined as any grassland (e.g., Northwestern Great Plains Mixedgrass Prairie) that has not been cultivated or mechanically disrupted for agriculture or other uses (Bauman et al. 2013) later defined as unbroken grassland (Bauman 2021) and is more likely to represent native prairie habitat. The assessment started with a desktop analysis of the proposed Project area using available databases and aerial imagery before culminating in field surveys. Imagery was derived from the USDA (2023), and existing land cover data pulled from the NLCD (USGS 2019) and the USDA National Agricultural Statistics Service (2021; see Appendix H). Surveys were done on the ground by a biologist who visually assessed the appearance of grassland to identify portions of broken sod. Of the entire proposed Project area, 27,678 acres were determined to be grassland habitat via desktop analysis, as described in detail in Appendix H. Of the total acres classified as grassland habitat within the proposed Project Area, 12,192 acres were categorized as broken grassland, whereas 14,915 acres were categorized as unbroken grassland. The remaining 571 acres of grassland were not surveyed due to access issues. Refer to the Grassland Habitat Assessment report in Appendix H for additional details regarding specific methods and the cumulative area.

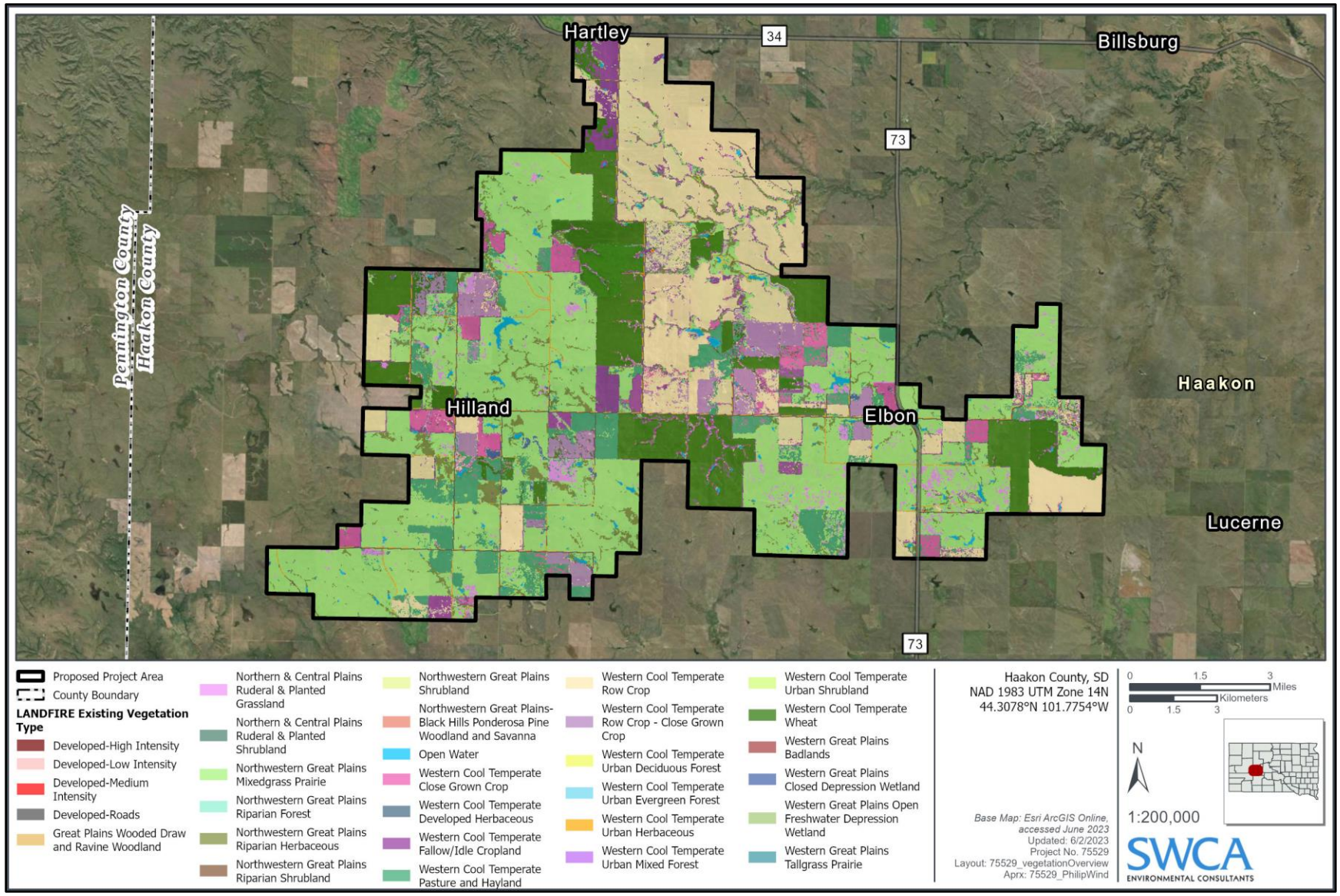

Figure 3-4. Vegetation types in the proposed Project area.

3.6.1.2 Noxious Weeds

According to the SDDANR, two state-listed and one locally recognized noxious weed species are known to occur in Haakon County (Table 3-16).

Table 3-16. State and Local Noxious Weeds of South Dakota

State Noxious Weeds	County Noxious Weeds
Canada thistle (*Cirsium arvense*)	Common mullein (*Verbascum thapsus*)
Hoary cress (*Lepidium draba*)	–

Sources: SDDANR (2017a, 2017b).

3.6.2 Environmental Consequences: Proposed Action

3.6.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. These measures would reduce the spread of noxious weeds and minimize disturbance area to vegetation, thereby protecting vegetation resources. The impact summaries below consider the vegetation-specific BMPs, including the following (see Appendix O and Table 2-3 for more detail on these BMPs):

- Avoid and minimize impacts to native vegetation resources to the extent possible through Project layout and design.
- Use appropriate erosion and sediment, spill control, and equipment cleaning measures.
- Revegetate areas of temporary construction impacts to pre-Project conditions.

3.6.2.2 Switchyard

The main types of impacts to vegetation from the Switchyard would be the temporary loss of vegetation in construction access areas, laydown yards, and work areas and the permanent loss of existing vegetation and broken grasslands where new facilities are constructed. Movement of construction equipment and soil disturbance creates the potential for establishment of exotic, weedy and invasives species, including noxious weeds.

in accordance with LANDFIRE classifications, the Switchyard would permanently impact 9 acres of vegetation, including 7 acres of Northwestern Great Plains Mixed grass Prairie, approximately 1 acre of Western Cool Temperate Pasture and Hayland, >1 acre of Western Cool Temperate Urban Herbaceous, and >1 acre of Western Cool Temperate Urban Shrubland, 6 acres of which are broken grasslands. As a result, the impacts to vegetation from the construction and operation of the Switchyard would be minor.

3.6.2.3 Wind Facility

The types of impacts to vegetation from the Wind Facility would be the same as those described for the Switchyard. Assuming the construction of all 95 turbines, up to 1,291 acres of vegetation would be temporarily disturbed by the construction of the Wind Facility. The largest affected vegetation type would be cropland (including Western Cool Temperate close grown crop, fallow/idle cropland, row crop, and

row crop-close grown crop), which accounts for 674 acres of the total disturbance. The Northwestern Great Plains Mixedgrass Prairie vegetation type accounts for 219 acres of the total disturbance.

The largest portion of vegetation disturbance would come from the construction of the underground collection lines, which would temporarily disturb up to 436 acres of vegetation. The Wind Facility turbine work areas would disturb up to 325 acres of vegetation (310 acres of which would be temporary and would be reclaimed after construction, leaving 15 acres of permanent disturbance). Isolated trees may need to be cleared as part of the temporary construction impacts; however, less than 1 acre of the temporary construction impacts overlap any forest classifications (Table 3-17). The remaining Wind Facility components, including the O&M building, laydown yards, crane paths, substation, and access roads, would disturb up to 629 acres of vegetation, 545 of which would be temporary and would be reclaimed after construction, leaving 84 acres of permanent disturbance). Total temporary disturbance to vegetation would be 1,291 acres (see Table 3-17) and total permanent disturbance would be 99 acres.

No turbines would be constructed on unbroken grassland. Of the 27,678 acres that were categorized as grassland in the proposed Project area, the Wind Facility construction disturbance would temporarily impact up to 47 acres of unbroken grassland and 193 acres of broken grasslands. Areas where access roads and transmission towers would be located would result in up to 2 acres of permanent disturbance to areas classified as unbroken grasslands and 11 acres of broken grasslands.

Table 3-17. Vegetation Disturbance from the Wind Facility

LANDFIRE Classification	Permanent Disturbance Area (acres)	Temporary Disturbance Area (acres)	Percentage of Permanent Disturbance Area (%)	Percentage of Temporary Disturbance Area (%)
Developed-High Intensity	0	0	0%	0%
Developed-Low Intensity	< 1	< 1	< 1%	< 1%
Developed-Medium Intensity	0	0	0%	0%
Developed-Roads	1	15	< 1%	1%
Great Plains Wooded Draw and Ravine Woodland	0	< 1	0%	< 1%
Northern and Central Plains Ruderal and Planted Grassland	1	10	0%	1%
Northern and Central Plains Ruderal and Planted Shrubland	0	0	0%	0%
Northwestern Great Plains Mixedgrass Prairie	12	219	< 1%	16%
Northwestern Great Plains Riparian Forest	0	0	0%	0%
Northwestern Great Plains Riparian Herbaceous	1	15	< 1%	1%
Northwestern Great Plains Riparian Shrubland	0	0	0%	0%
Northwestern Great Plains Shrubland	0	0	0%	0%
Northwestern Great Plains-Black Hills Ponderosa Pine Woodland and Savanna	0	0	0%	0%
Open Water	0	< 1	0%	< 1%
Western Cool Temperate Close Grown Crop	3	46	< 1%	3%
Western Cool Temperate Developed Herbaceous	0	0	0%	0%
Western Cool Temperate Fallow/Idle Cropland	4	52	< 1%	4%
Western Cool Temperate Pasture and Hayland	10	132	1%	9%

LANDFIRE Classification	Permanent Disturbance Area (acres)	Temporary Disturbance Area (acres)	Percentage of Permanent Disturbance Area (%)	Percentage of Temporary Disturbance Area (%)
Western Cool Temperate Row Crop	39	503	3%	36%
Western Cool Temperate Row Crop – Close Grown Crop	6	73	< 1%	5%
Western Cool Temperate Urban Deciduous Forest	0	< 1	0%	< 1%
Western Cool Temperate Urban Evergreen Forest	0	0	0%	0%
Western Cool Temperate Urban Herbaceous	1	12	< 1%	1%
Western Cool Temperate Urban Mixed Forest	0	0	0%	0%
Western Cool Temperate Urban Shrubland	< 1	2	< 1%	0%
Western Cool Temperate Wheat	20	210	1%	15%
Western Great Plains Badlands	0	0	0%	0%
Western Great Plains Closed Depression Wetland	0	1	0%	< 1%
Western Great Plains Open Freshwater Depression Wetland	0	0	0%	0%
Western Great Plains Tallgrass Prairie	0	0	0%	0%
Total	**99**	**1,291**	**7%**	**93%**

Source: LANDFIRE (2023).
Note: Sums of values may not add to total value shown, due to rounding.

Invasive and noxious weeds have the potential to be spread by construction activities. Groundbreaking activities, erosion, and sedimentation all have the potential to create pathways for invasive weed establishment. Furthermore, noxious weeds can establish themselves across the proposed Project area on construction equipment or travel via workers shoes or vehicles. Similar to other UGP sites, the proposed Project area is especially susceptible to 1) grass-like invasives because they are so similar to native vegetation and 2) woody trees and shrubs, which outcompete native species through changing the structure of the ecosystem (Gaskin et al. 2021).

The Wind Facility would temporarily and permanently impact 1,291 and 99 acres of vegetation resources respectively. Areas that would be temporarily impacted during construction and not needed for O&M would be returned to pre–Wind Facility land use through revegetation. As a result, the impacts to vegetation from the construction and operation of the Wind Facility would be minor.

Decommissioning impacts would be the same or fewer than those described for construction. Temporary impacts would occur while grasslands and other nonagricultural plant communities are crossed for deconstruction and removal of infrastructure. Permanently impacted land would be restored to pre–Wind Facility land use such as agricultural production and revegetation of grasslands.

3.6.2.4 Vegetation Conclusion

During Project construction, up to 1,291 acres would be temporarily disturbed and 99 acres would be permanently disturbed. The dominant vegetation type in the proposed Project area is Northwestern Great Plains Mixedgrass Prairie (25,856 acres), and the Project has been designed to minimize temporary impacts to 219 acres and permanent impacts to 19 acres. The second most dominant vegetation type is Western Cool Temperate Row Crop, 503 acres of which may be temporarily disturbed and 39 which may be permanently disturbed by construction activities.

Of the 12,192 acres categorized as broken grassland, up to 17 acres would be permanently disturbed, and up to 193 acres would be disturbed temporarily. Of the 14,915 acres categorized as unbroken grassland, up to 47 acres would be temporarily disturbed, and up to 2 acres would be permanently disturbed by access roads and transmission towers. No turbines would be constructed on unbroken grassland. Invasive and noxious weeds have the potential to be spread by proposed Project activities that result in ground disturbance. According to SDDANR, only two state-listed and one locally recognized noxious weed species are known to occur in Haakon County. The Project has committed to limit the establishment and spread of these species through industry BMPs.

Impacts to vegetation would be dispersed throughout the proposed Project Area and distributed over 16 different vegetation types. The Project also minimized impacts to native vegetation resources through Project layout and design and has committed to BMPs that include using appropriate equipment cleaning measures and revegetating areas that would be temporarily impacted during construction to pre-Project conditions. Therefore, the Project's proposed impacts to vegetation would be minor and considered less than significant.

3.6.3 Environmental Consequences: No Action Alternative

The No Action Alternative would cause no impacts to vegetation, and existing activities would continue.

3.7 WILDLIFE

3.7.1 Existing Conditions

Section 4.6.2 – Wildlife of the UGP PEIS discusses general descriptions of wildlife species that may be affected by wind energy development projects within the UGP region. The proposed Project area is located in the Northwestern Great Plains Level III ecoregion (Wiken et al. 2011).

Several wildlife studies have been conducted for the Project and are listed in Table 3-18. Wildlife study reports completed by Philip Wind Partners are included in Appendices B through G. Previously completed studies are considered as cited and included in the Project record. Study results are summarized below.

Table 3-18. Philip Wind Energy Center Wildlife Studies

Study	Survey Period
Eagle use survey	August 2017–July 2018; August 2018–July 2019
Eagle nest survey	June–July 2018
Eagle utilization distribution monitoring	May–June 2022
Prairie grouse (i.e., sharp-tailed grouse and greater prairie-chicken) lek survey	July 2018; April–May 2022; March–May 2023
Whooping crane habitat assessment	August 2018; February 2023
Bat acoustic survey	April-November 2018
Avian use survey	August–November 2017; March–August 2018; January 2022–March 2023
Prairie dog colony status and mapping	January–October 2022
NLEB habitat assessment	May–October 2022
Raptor nest survey	January–June 2022; February–June 2023

In addition to the wildlife and habitat studies, Philip Wind Partners conducted grassland assessments and mapping in July 2018 and September 2022, which is discussed in Section 3.6.1.1. A water resources analysis was also conducted in October 2022. Section 3.3.1 describes the findings of the water resources analysis, as well as the methods for the in-field wetland delineation that will be conducted in 2023.

3.7.1.1 General Wildlife

Species common to the Northwestern Great Plains Level III ecoregion include white-tailed deer (*Odocoileus virginianus*), pronghorn (*Antilocapra americana*), bobcat (*Lynx rufus*), cougar (*Puma concolor*), prairie dog (*Cynomys* spp.), jackrabbit (*Lepus* spp.), and prairie rattlesnake (*Crotalus viridis*) (Wiken et al. 2011).

Wildlife habitats are defined through the vegetation covers identified in Section 3.6. Anthropogenic land uses, including cropland, have a lower wildlife habitat value than higher quality habitats such as forests, wetlands, and native prairie grasslands. Wildlife is more likely to be present in those habitats. Although birds fly over all land cover types, their nesting habitats and food sources are generally found in forested and grassland habitats.

Prairie dog colonies provide habitat and a food source for several protected species of wildlife with their own setback requirements identified in the UGP PEIS. In order to define the turbine setback from prairie dog colonies, surveys were conducted according to the methodologies reported in Appendix D. In total, 12 locations were surveyed for the presence of prairie dog colonies in the proposed Project Area and a 2-mile buffer based on historical data and desktop review of aerial imagery. Six historical colonies were surveyed; three were still active and three were absent. An additional six colonies were located; three were inactive based on evidence of unused burrows, two were active based on the presence of fresh burrows, tracks, fecal droppings, and prairie dogs, and one location was identified during the desktop digitizing as a potential prairie dog colony but was determined to be nonexistent in the field.

3.7.1.2 Birds

Bird species common to the Northwestern Great Plains Level III ecoregion include western meadowlark (*Sturnella neglecta*), sage thrasher (*Oreoscoptes montanus*), northern pintail (*Anas acuta*), golden eagle (*Aquila chrysaetos*), and ferruginous hawk (*Buteo regalis*) (Wiken et al. 2011).

There are no Important Bird Areas or other lands designated specifically as bird habitat in the proposed Project area (National Audubon Society 2023). Point count surveys were conducted to catalog bird species observed and estimate bird use at numerous locations within the proposed Project area (Tetra Tech 2017, 2018). A site reconnaissance visit was conducted on September 13, 2022, which identified seven small and large bird species. The observed small and large bird species, exclusive of the raptors described below, were black-billed magpie (*Pica hudsonia*), common raven (*Corvus corax*), dark-eyed junco (*Junco hyemalis*), horned lark (*Eremophila alpestris*), lark bunting (*Calamospiza melanocorys*), ring-necked pheasant (*Phasianus colchicus*), and sharp-tailed grouse (*Tympanuchus phasianellus*). No federally listed species were observed during the September 13, 2022, site reconnaissance visit. Discussion of sharp-tailed grouse and greater prairie-chicken can be found in Section 3.8.

In addition to avian surveys conducted in 2017-2019, Philip Wind Partners reinitiated monthly avian surveys in January 2022 that focus on eagles and other large birds. Large birds are defined as waterbirds, waterfowl, shorebirds, gulls/terns, diurnal raptors (i.e., kites, accipiters, buteos, eagles, falcons, northern harrier, and osprey), owls, vultures, upland game birds, doves/pigeons, nightjar, and large corvids. Initially 38 points were surveyed with an additional 12 survey points added in response to Project area modifications totaling 50 survey points. A biologist documented all large birds observed over 60 minutes

at each point per month. There were 52 species observed throughout the 15-month survey. Large bird number of species observed was highest during spring (40 species) followed by summer (39), fall (25), and winter (16). Large birds observed during these surveys averaged 8.59 observations per 60-minute survey, ranging from 2.29 in the winter to 18.20 in the spring, showing a similar trend as number of species observed.

Between April 2023 and March 2024, Philip Wind Partners is conducting additional eagle and large bird use surveys to identify temporal and spatial use of all large birds in the proposed Project area, with a focus on eagles in accordance with the USFWS Eagle Conservation Plan Guidance (USFWS 2013). Raptor nest surveys were also conducted in accordance with the USFWS Eagle Conservation Plan Guidance (USFWS 2013) to identify and record the location and status of all raptor nests in the proposed Project area, and to update results of previous raptor surveys such as the eagle use and nest surveys conducted between 2017 and 2019.

Between January 13 and June 15, 2022, raptor nest surveys were conducted in an earlier iteration of the proposed Project area and a 2-mile buffer surrounding the proposed Project area during five survey events (three ground-based surveys; three aerial flight surveys).

The 2022 surveys resulted in the observation of one occupied bald eagle (*Haliaeetus leucocephalus*) nest in the proposed Project area and one occupied golden eagle nest within a 2-mile buffer surrounding the proposed Project area. Additionally, six non-eagle raptor nests were documented in the proposed Project area and a 2-mile buffer, consisting of three unidentified raptor nests in the proposed Project area and three occupied red-tailed hawk (*Buteo jamaicensis*) nests within the 2-mile buffer. During a site reconnaissance visit conducted on September 13, 2022, five raptor species were observed: bald eagle, golden eagle, northern harrier (*Circus hudsonius*), red-tailed hawk, and turkey vulture (*Cathartes aura*). Additional information on bald and golden eagles can be found in Section 3.8.

Additional raptor nest surveys were completed between February 2 and June 1, 2023, within the proposed Project area displayed in Figure 1-2. These surveys included two ground-based surveys and two aerial surveys within the proposed Project area and a 2-mile buffer surrounding the proposed Project area. The survey results indicated the previously known bald eagle and golden eagle nest in the proposed Project area were still occupied during the first two mobilizations (February–March 2023). However, during the last two mobilizations (May– June 2023), the bald eagle nest was taken over by a great horned owl with young and the golden eagle nest by a red-tailed hawk. One new eagle nest was discovered just east of the previously known occupied eagle nest.

In total, 12 non-eagle raptor nests were also documented within the proposed Project area and 2-mile buffer; two occupied great horned owl nests, three occupied red-tailed hawk nests and three unidentified raptor nests were documented within the Project area; and two occupied great horned owl nests and two occupied red-tailed hawk nests were identified within the 2-mile buffer. One occupied great blue heron rookery was identified within the 2-mile buffer.

3.7.1.3 Bats

According to the South Dakota Bat Management Plan, 12 species of bat are known to occur currently or historically in South Dakota (South Dakota Bat Working Group 2004) (Table 3-19). In September 2022, the USFWS proposed the uplisting of the tricolored bat to the endangered species list. The proposed Project area falls within the species habitat range, and therefore has been included in Table 3-19. Studies of bat activity and habitat were conducted in the proposed Project area with particular interest in the NLEB because it is federally endangered. A NLEB habitat assessment (see Appendix E) and acoustic study (Tetra Tech 2019) provide insight into the potential presence of the NLEB and other bat species.

Table 3-19. Bat Species Potentially Occurring in the Proposed Project Area

Common Name	Scientific Name	Status (federal; state)
Big brown bat	*Eptesicus fuscus*	–
Eastern red bat	*Lasiurus borealis*	–
Evening bat	*Nycticeius humeralis*	–
Fringed bat	*Myotis thysanodes*	–
Hoary bat	*Lasiurus cinereus*	–
Little brown myotis	*Myotis lucifugus*	–
Long-eared bat	*Myotis evotis*	–
Long-legged bat	*Myotis volans*	–
Northern long-eared bat	*Myotis septentrionalis*	FE; SGCN
Silver-haired bat	*Lasionycteris noctivagans*	SGCN
Townsends big-eared bat	*Corynorhinus townsendii*	SGCN
Tricolored bat	*Perimyotis subflavus*	Proposed Endangered
Western small-footed myotis	*Myotis ciliolabrum*	–

Note: FE = Federally endangered; SGCN = South Dakota Species of Greatest Conservation Need.

Two preconstruction studies have been completed to evaluate bats, specifically the NLEB. The first bat study was a passive acoustic study using five detection stations for 892 detector nights (Tetra Tech 2019) over as many as 211 nights per detector from April to November 2018. This type of study records bat calls and uses a combination of software and manual review to analyze and classify the calls to document bats species present and their activity level. This study resulted in 14,262 bat calls for which none were classified as the NLEB. A breakdown of acoustic detections is provided in Table 3-20. The most common bat species detected (32%) was the big brown bat. Other species that accounted for 10% to 20% of detections included the hoary bat, little brown myotis, silver-haired bat, and western small-footed myotis. Three groups of bats were detected that could not be identified to species: unidentified high frequency bats, unidentified low frequency bats, and unidentified myotis. Each of these groups accounted for less than 1% of bat calls. The acoustic software used for the study autoclassified 32 NLEB recordings; however, upon further manual analysis, these incidences were determined to be western small-footed bat, long-legged myotis, or unidentified myotis. None of the acoustic detections were confirmed to be the NLEB or the tricolored bat.

Table 3-20. Acoustic Detections of Bats in the Proposed Project Area

Common Name	Scientific Name	Percentage of Detections (%)
Big brown bat	*Eptesicus fuscus*	32%
Eastern red bat	*Lasiurus borealis*	4%
Fringed bat	*Myotis thysanodes*	0%
Hoary bat	*Lasiurus cinereus*	18%
Little brown myotis	*Myotis lucifugus*	17%
Long-legged bat	*Myotis volans*	4%
Silver-haired bat	*Lasionycteris noctivagans*	12%
Western small-footed myotis	*Myotis ciliolabrum*	12%

Common Name	Scientific Name	Percentage of Detections (%)
Unidentified high frequency bats	N/A	< 1%
Unidentified low frequency bats	N/A	< 1%
Unidentified *Myotis* spp.	N/A	< 1%

Note: N/A = not applicable.

The second bat study was a summer foraging and roosting habitat evaluation specific to NLEB (see Appendix E), which identified potential summer bat habitat in the proposed Project Area and a 2.5-mile buffer of the proposed Project area. The NLEB is further discussed in Section 3.8.

3.7.2 Environmental Consequences: Proposed Action

3.7.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. These measures would minimize impacts to wildlife. The impact summaries below consider the wildlife-specific BMPs, including the following (see Appendix O and Table 2-3 for more detail on these BMPs):

- Complete preconstruction surveys to identify wildlife presence and active habitat areas for avoidance.
- Avoid and minimize impacts to wildlife resources to the extent possible through Project layout and design.
- Prepare and implement a Bird and Bat Conservation Strategy (BBCS).
- Revegetate areas of temporary construction impacts to pre-Project conditions to restore wildlife habitat.

3.7.2.2 Switchyard

The main types of impacts to wildlife from the Switchyard would be 1) the temporary and permanent loss of habitat or potential displacement of wildlife where new facilities are constructed, and 2) the temporary loss of habitat in construction access areas, laydown yards, and work areas. Ground clearing would affect habitats for birds, mammals, and other wildlife species. Loss and fragmentation of native prairie habitat, which likely represents unbroken grassland described above, can detrimentally affect both migratory and nonmigratory birds. Approximately 7 acres of Northwestern Great Plains Mixedgrass Prairie would be permanently impacted with no temporary impacts. This grassland in the Switchyard is also mapped as broken grassland.

During construction, wildlife might avoid the area because of increased traffic and noise, but once construction is completed, this temporary impact would cease. During the Switchyard construction and O&M, direct mortality may result from collisions with vehicles, but this potential impact would be minimized through BMPs derived from the UGP PEIS and the Applicant's additional voluntary environmental protection measures. The overall disturbance to wildlife species and habitat would be minor.

The Switchyard decommissioning impacts would be like those described for the construction of the Switchyard. Many BMPs and mitigation measures that are applicable to Project construction activities are

also applicable to Project decommissioning activities, which would avoid and minimize direct and indirect impacts to wildlife.

3.7.2.3 Wind Facility

The types of ground-based impacts to wildlife from the Wind Facility would be the same as those described for the Switchyard. During O&M, the Project may impact wildlife through collisions with turbines, aboveground gen-tie lines, or vehicular traffic. Ground clearing, which causes habitat degradation, alteration, loss, and fragmentation, would affect habitats for birds, mammals, and other wildlife species. Natural resources setbacks have been applied to turbine locations to avoid sensitive resources and are presented in Table 1-1; however, direct and indirect impacts to wildlife species and their habitats could occur from the construction of the Wind Facility and the increased vehicular traffic density and long-term disturbance during Wind Facility O&M.

Approximately 219 acres of Northwestern Great Plains Mixedgrass Prairie would be temporarily impacted, and approximately 12 acres would be permanently impacted. Approximately 15 acres of Northwestern Great Plains Riparian Herbaceous would be temporarily impacted, and approximately 1 acre would be permanently impacted. Therefore, the Wind Facility would permanently impact approximately 13 acres of grasslands. This would be a minor area of disturbance to wildlife habitat.

The Wind Facility may affect raptor, migratory bird, and bat species through habitat degradation or displacement of individuals. During construction, wildlife might avoid the area because of increased traffic and noise, but once construction is completed, this temporary impact would cease. Potential impacts from construction may also include nest or burrow abandonment or loss of eggs or young. This could result in a decrease in reproductive success for certain individuals, but this potential impact would be minimized through BMPs derived from the UGP PEIS and the Applicant's additional voluntary environmental protection measures.

During Wind Facility construction and O&M, direct wildlife mortality may result from collisions with vehicles, aboveground gen-tie lines, or turbines. As noted in Section 3.8.2.3.4, turbines will be feathered to minimize collisions with all bat species, including the tricolored bat.

Wind Facility decommissioning impacts would be like those described for the construction of the Wind Facility. Many BMPs and mitigation measures that are applicable to Wind Facility construction activities are also applicable to Wind Facility decommissioning activities.

3.7.2.4 Wildlife Conclusion

Section 5.6.1.2 – Wildlife of the UGP PEIS describes potential impacts that could occur to wildlife during a wind energy project's life cycle. The proposed Project would have limited impacts to wildlife, including habitat disturbance and mortality from collisions with vehicles, gen-tie lines, and turbines that fall within the species types and range of impacts identified in the UGP PEIS. The Project has also completed preconstruction surveys to identify wildlife presence and habitat areas and avoided or minimized impacts to wildlife resources through Project layout and design. A BBCS will be prepared and implemented, and areas of temporary construction impacts would be revegetated to pre-Project conditions to restore wildlife habitat. Therefore, the proposed Project's impacts to wildlife resources are consistent with the analysis in the UGP PEIS and would not result in new or more severe significant impacts than described in the UGP PEIS.

3.7.3 Environmental Consequences: No Action Alternative

Under the No Action Alternative, the Project would not be developed, and impacts to wildlife are anticipated to continue at existing levels.

3.8 SPECIAL-STATUS SPECIES

3.8.1 Existing Conditions

Special-status species include any species that is listed, or proposed for listing, as threatened or endangered by the USFWS, as well as species of special concern. Species of special concern include species listed as USFWS Birds of Conservation Concern (BCC) (USFWS 2021, 2023b), SDGFP South Dakota Species of Greatest Conservation Need (SGCN) (SDGFP 2014), and sensitive species, such as prairie grouse (i.e., sharp-tailed grouse and greater prairie-chicken [*Tympanuchus cupido*]).

The USFWS Information for Planning and Consultation (IPaC) report identified two federally endangered species, two federally threatened species, and one candidate species that could occur in the proposed Project area (USFWS 2023b). Species appearing on this list and their potential for occurrence in the proposed Project area are identified in Table 3-21. The proposed Project area does not contain designated critical habitat for federally listed threatened or endangered species (USFWS 2023b, 2023c).

Table 3-21. Federally Listed Species and their Potential to Occur in the Proposed Project Area

Common Name	Scientific Name	Federal Status	Potential for Occurrence in the Proposed Project Area
Birds			
Rufa red knot	*Calidris canutus rufa*	Threatened	Low
Piping plover	*Charadrius melodus*	Threatened	Low
Whooping crane	*Grus americana*	Endangered	Low
Mammals			
NLEB	*Myotis septentrionalis*	Endangered	Low
Insects			
Monarch butterfly	*Danaus plexippus*	Candidate	Moderate

Source: USFWS (2023b).

3.8.1.1 Rufa Red Knot

The rufa red knot (*Calidris canutus rufa*) was listed as federally threatened on January 12, 2015 (79 *Federal Register* [FR] 73705 [December 11, 2014]). The rufa red knot is a medium-sized shorebird (USFWS 2023d). The rufa red knot is typically found along sandy beaches and shorelines, or on large mudflats (Cornell Lab of Ornithology 2023). The rufa red knot migrates long distances between nesting areas in mid- and high-arctic latitudes and southern nonbreeding habitats as far north as the coastal United States (low numbers) and southward to southern South America. Populations, including subspecies of rufa, migrate in large flocks northward through the contiguous United States mainly between March and early June, and southward in July and August (Harrington 2001).

The rufa red knot has potential to occur in the region during spring and fall migration periods, and every county in South Dakota is listed as a potential brief stopover location during migration. Rufa red knots

have been observed along the Missouri River Valley; however, there are no consistent stopovers in the Central Flyway.

The nearest reported rufa red knot observation, detected in 2002, was approximately 74 miles east of the proposed Project area (eBird 2023). A second observation was recorded approximately 76 miles east of the proposed Project area and included nine individuals in May 2016 (eBird 2023). As identified in the PBA Consistency Evaluation Forms, the nearest suitable habitat is 30 miles from the proposed Project area. In addition, it is unlikely for the rufa red knot to occur in the proposed Project area or within a 2.5-mile buffer surrounding the proposed Project area (Piorkowski et al. 2023). During the site reconnaissance visit conducted on September 13, 2022, and the avian use studies in 2017, 2018, and from 2022 to 2023, no rufa red knots were observed.

3.8.1.2 Piping Plover

The piping plover (*Charadrius melodus*) was listed as federally threatened in 1985 (50 FR 50726 [December 11, 1985]), with the Northern Great Plains and Atlantic Coast populations listed as threatened and the Great Lakes population listed as endangered (USFWS 2023e). The piping plover is a small shorebird that breeds only in three geographic regions of North America: the Atlantic Coast, the Northern Great Plains, and the Great Lakes (USFWS 2023e). In South Dakota, piping plover nests mainly along Lake Oahe and below Fort Randall and Gavin's Point Dams and rarely on alkaline wetlands in northeastern South Dakota and along lakeshores in western South Dakota (SDGFP 2019).

The nearest reported piping plover observation was made in 2014, approximately 20 miles southwest from the proposed Project area (eBird 2023). Most reported observations of piping plover occur around Pierre, South Dakota, approximately 60 miles east of the proposed Project area within designated critical habitat for the species approximately 30 miles to the northeast of the proposed Project area. No alkali lakes were observed in the proposed Project area (see Appendix K); however, in dry years, piping plover could occur within dried-up wetlands. There is limited to no suitable habitat in the proposed Project area. During a site reconnaissance visit conducted on September 13, 2022, and the avian use studies during 2017, 2018, and 2022 through 2023, no piping plovers were observed.

3.8.1.3 Whooping Crane

The whooping crane (*Grus americana*) was listed as federally endangered in 1967 (32 FR 4001 [March 11, 1967]) in the United States by the USFWS and in 1978 in Canada by the Committee on the Status of Endangered Wildlife in Canada (USFWS 2023f). Historically, population declines were caused by shooting and destruction of nesting habitat in the prairies from agricultural development. Current threats to the species include collisions with human-made objects (i.e., power lines and fences), shooting, chemical spills (within the Intracoastal Waterway in their winter habitat), predators, disease, habitat destruction, severe weather, and loss of genetic material (USFWS 2023f).

The whooping crane has one natural wild population of approximately 543 individuals (Butler et al. 2022). Members of this population nest within and directly adjacent to Wood Buffalo National Park in the Northwest Territories and Alberta, Canada, and winter mainly in and adjacent to Aransas National Wildlife Refuge along the central Texas coast (Government of Canada 2015; USFWS 2023f). The proposed Project area is located within the corridor containing 95% of the whooping crane sightings (Pearse, Rabbe, Bidwell et al. 2018; Pearse, Rabbe, Juliusson et al. 2018).

Whooping cranes may probe the soil subsurface with their bills for foods on the soil or vegetation substrate (USFWS 2023f). Whooping cranes are omnivores, and foods typically include agricultural grains, as well as insects, frogs, rodents, small birds, minnows, berries, and plant tubers. Whooping cranes

spend the largest amount of time during migration feeding in harvested grain fields (USFWS 2023f). Studies indicate that whooping cranes use a variety of habitats during migration, in addition to cultivated croplands, and generally roost in small palustrine (marshy) wetlands within 1 kilometer of suitable feeding areas (Howe 1987, 1989).

Philip Wind Partners conducted a whooping crane habitat assessment in the proposed Project area in February 2023 using the methods defined in Appendix C. The assessment assisted Philip Wind Partners in determining potentially suitable whooping crane stopover habitat in the proposed Project area by considering three distinct methodologies of quantifying suitable habitat and whooping crane habitat use. The first methodology considers wetland habitat suitability through The Watershed Institute Wetland Suitability Model (The Watershed Institute 2012); the second considers a predicted habitat use model by Niemuth et al. (2018) that predicts the use of habitat by whooping crane; and the third considers an additional approach by Niemuth et al. (2018) that calculates high use areas by deciles (or $1/10^{th}$ parts) and defines suitable wetland stopover habitat as wetlands within the five highest use deciles. Based on this three-method approach, it was determined that the proposed Project area contains 415 acres of potentially suitable habitat, of which 5 acres are considered suitable wetland stopover habitat, with a 0.4% chance that whooping cranes will use that habitat over any given year (see Appendix C).

3.8.1.4 Northern Long-Eared Bat

The USFWS listed the NLEB as federally threatened in 2015 (80 FR 17974 [April 2, 2015]). In November 2022, the USFWS reclassified the NLEB as federally endangered, resulting in the removal of the species-specific rule issued under Section 4(d) of the ESA (87 FR 73488 [November 30, 2022]). The primary threat to this species is the fungus *Pseudogymnoascus destructans*, which causes white-nose syndrome; however, other factors impacting this species include wind energy development, climate change, and habitat loss (87 FR 73488 [November 30, 2022]). White-nose syndrome has not been confirmed in Haakon County; however, occurrence has been confirmed in Pennington County in 2021 and 2022 (White-Nose Syndrome Response Team 2022).

The range of the NLEB extends throughout most of southern Canada, as well as the eastern and midwestern United States (excluding parts of the southeastern United States and is primarily associated with North American forests (USFWS 2023g). The NLEB hibernates during winter months in caves and mines with constant temperatures and very high humidity (USFWS 2023h). Summer habitat for the NLEB consists of forested areas with trees greater than 2 inches in diameter at breast height (USFWS 2023h). NLEBs roost in live trees and/or snags that have exfoliating bark, cracks, crevices, and/or cavities (USFWS 2023h). The species typically forages in forest interiors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure (USFWS 2023i). NLEBs also may roost in human-made structures such as buildings, barns, bridges, and bat houses (USFWS 2023h).

Two North American Bat Monitoring Program detectors in South Dakota have documented NLEBs: one in Custer County in 2020 and one in Lawrence County in 2022 within the Black Hills National Forest (USGS 2023f). The proposed Project area is approximately 68 miles from the nearest known hibernaculum in Black Hills, South Dakota.

Two preconstruction studies have been completed to evaluate bats, specifically NLEBs. The first was an acoustic study using five detection stations for 892 detector nights, as defined in the methods contained in Appendix E. This acoustic study resulted in 14,262 bat calls for which none were classified as NLEB. The second study was a summer foraging and roosting habitat evaluation (see Appendix E) completed following guidance from the USFWS's *Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines* (USFWS 2022) and field validated on September 13, 2022. Suitable summer foraging and roosting habitat was defined as patches of trees 10 acres or greater and included a 1,000-foot buffer

(hereafter, connected habitat buffer) as recommended by USFWS guidance. NLEBs migrate from summer habitat to hibernacula in the fall. NLEBs have been documented to travel up to 35 miles from summer foraging habitat to hibernacula (USFWS 2022). The proposed Project area contains 1,508 acres of connected habitat, 65 acres of potential summer habitat, and is approximately 68 miles from the nearest known hibernaculum in the Black Hills, South Dakota.

3.8.1.5 Monarch Butterfly

The monarch butterfly (*Danaus plexippus*) is a candidate species for federal listing and breeds year-round in many regions. In temperate climates, such as eastern and western North America, the monarch butterfly will undergo long-distance migration and live for an extended length of time. Monarch butterflies lay their eggs on their obligate milkweed host plant (primarily *Asclepias* spp.). Larvae emerge after 2 to 5 days and develop through five larval instars (the time between molts) over 9 to 18 days. The larvae feed on milkweed and sequester toxic chemicals (cardenolides) as a defense against predators. Larvae pupate into a chrysalis and emerge 6 to 14 days later as an adult butterfly. Multiple generations of monarch butterflies are produced during the breeding season, and adults live approximately 2 to 5 weeks. Overwintering adults enter reproductive diapause and live 6 to 9 months (USFWS 2023j). Monarch butterflies found in South Dakota belong to a population that breeds east of the Rocky Mountains and overwinter in Mexico (Monarch Watch 2010).

No monarch butterflies were identified during the site reconnaissance in the proposed Project area or within the 2-mile buffer (Piorkowski et al. 2023). It is important to note that the site reconnaissance was conducted on September 13 and October 13 to 14, 2022, when monarch butterflies are migrating (Bird Watching HQ 2023).

Aerial imagery analysis indicates that the grassy areas within and adjacent to the proposed Project area have the potential to contain milkweed that could be used by the monarch butterfly. Any potential prairie habitat in the Project area would likely be located within the areas classified as Northwestern Great Plains Mixedgrass Prairie and Northwest Great Plains Riparian Herbaceous (see Table 3-15).

3.8.1.6 Species of Special Concern

Species of special concern include species listed as USFWS BCC (USFWS 2021, 2023b), SDGFP South Dakota SGCN (SDGFP 2014), and sensitive species, such as prairie grouse (i.e., sharp-tailed grouse and greater prairie-chicken). Bald and golden eagles are also considered species of special concern due to their protection under the Bald and Golden Eagle Protection Act of 1940 (BGEPA). Federally listed species are discussed in Sections 3.8.1.1 through 3.8.1.4.

As discussed in Section 3.7.1.2, eagle nest surveys have been conducted in the proposed Project area in 2022 and 2023 and will continue through March 2024. The January 2022 through March 2023 avian use surveys noted the presence of the bald and golden eagle, both of which are protected under the BGEPA. Survey methods in the avian use surveys for eagle observations are the same as those described in Section 3.7.1.2. Data was collected for eagles based on the recommendations in the USFWS Eagle Conservation Plan Guidance and the 2016 Final Eagle Rule.

There were 24 observations of bald eagle and 50 observations of golden eagle. The bald eagle observations averaged 0.01 observations per survey and was highest during winter (0.08) followed by spring (0.04), summer (0.01), and fall (0.01). Golden eagle observations averaged 0.03 observations per survey and was the highest during winter (0.11) followed by spring (0.10), fall (0.07), and summer (0.03).

Because one active bald eagle nest with an egg and/or nestling was identified in the proposed Project area, Philip Wind Partners conducted eagle utilization distribution monitoring in the proposed Project area at

that one nest between May 14 and June 22, 2022. The objective of eagle utilization distribution monitoring was to gain information on how bald eagles utilize the area around the active nest spatially by mapping flight paths to and from the nest. One bald eagle observation was recorded during a total of 28 hours (seven 4-hour surveys) of nest monitoring. Nest failure was confirmed on June 22, 2022, because no eagle observations were made during two consecutive surveys occurring on June 15 and June 22, 2022.

The USFWS IPaC report identified nine species listed as USFWS BCC that could occur in the proposed Project area (USFWS 2023b): bobolink (*Dolichonyx oryzivorus*), chestnut-collared longspur (*Calcarius ornatus*), ferruginous hawk, lark bunting, lesser yellowlegs (*Tringa flavipes*), marbled godwit (*Limosa fedoa*), prairie falcon (*Falco mexicanus*), red-headed woodpecker (*Melanerpes erythrocephalus*), and Sprague's pipit (*Anthus spragueii*) (Piorkowski et al. 2023). Additionally, the USFWS IPaC report identified the bald eagle, which is protected under the BGEPA (USFWS 2023b). As discussed above, lark bunting was observed during the September 2022 site reconnaissance visit, and bald eagle was observed during raptor nest surveys, eagle utilization distribution monitoring, and the September 2022 site reconnaissance visit. Additional species listed as BCC that were not included on the USFWS IPaC report and observed during the September 2022 site reconnaissance visit include northern harrier.

The SDGFP identifies 101 animal species listed as SGCN: 29 bird species, 11 mammal species, 12 reptile or amphibian species, 11 terrestrial insect species, nine freshwater mussel species, four gastropod species, 21 fish species, and four aquatic insect species (SDGFP 2014). SGCNs observed during the September 2022 site reconnaissance visit include the bald eagle and lark bunting. Additionally, greater prairie-chicken (*Tympanuchus cupido*), an SGCN, was observed within a 2-mile buffer surrounding the proposed Project area during prairie grouse lek surveys conducted in April and May 2022.

Prairie grouse lek surveys, including surveys for both sharp-tailed grouse and greater prairie-chicken, were conducted in the proposed Project area and a 2-mile buffer surrounding the proposed Project area during three aerial flights between April 4 and May 11, 2022. No ground-based surveys were conducted during the 2022 surveys. A lek is an assembly area where animals (such as the prairie grouse) display courtship behavior, and can vary in number and location on an annual basis. These surveys followed guidance from the SDGFP Prairie Grouse Management Plan for South Dakota 2017–2021 (SDGFP 2017). There were 31 new and historical leks observed during the surveys. Table 3-22 presents the 2022 prairie grouse lek survey results, including the locations (in the proposed Project area or within the 2-mile buffer), species, and lek status observed.

Philip Wind Partners conducted additional prairie grouse lek surveys in 2023, revisiting the 2022 active lek locations via one aerial survey, as well as conducted three ground surveys per the feedback received from SDGFP. The ground surveys were conducted between March 27 and May 6, 2023 (period when prairie grouse are active at leks). The aerial survey was conducted within the same timeframe to cover areas not accessible by the ground survey. There were 69 new and historical leks observed during the 2023 surveys. (Table 3-22). Philip Wind shared its survey results with the USFWS and SDGFP and committed to the agencies that it would remove at least four turbines that had been planned in proximity to leks and suitable prairie grouse habitat. The turbine siting modifications will be included in the final EA.

Table 3-22. Prairie Grouse Lek Survey Results

Location	Species	Active Status	Inactive Status	Total
2022 Results				
Proposed Project area	Sharp-tailed grouse	11	2	13

Location	Species	Active Status	Inactive Status	Total
2-mile buffer	Sharp-tailed grouse	15	2	17
Proposed Project area	Greater prairie-chicken	0	0	0
2-mile buffer	Greater prairie-chicken	1	0	1
Total	**Both species**	**27**	**4**	**31**
2023 Results				
Proposed Project area	Sharp-tailed grouse	12	N/A*	12
2-mile buffer	Sharp-tailed grouse	18	N/A*	18
Proposed Project area	Greater prairie-chicken	19	N/A*	19
2-mile buffer	Greater prairie-chicken	18	N/A*	18
Proposed Project area	Mixed species	1	N/A*	1
2-mile buffer	Mixed Species	1	N/A*	1
Total	**All species**	**69**	**N/A***	**69**

* N/A = not applicable. Inactive prairie grouse lek were not included in the 2023 survey results. Only active prairie grouse lek were revisited.

3.8.2 Environmental Consequences: Proposed Action

3.8.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) in addition to the Applicant's additional voluntary environmental protection measures (see Table 2-3).

Philip Wind Partners has also committed to the BMPs and species-specific conservation measures identified in the PBA Consistency Evaluation Forms. The PBA Consistency Evaluation Forms have been developed for the following federally listed, candidate, or proposed species that may occur in the proposed Project area: NLEB, piping plover, whooping crane, and rufa red knot. The Project is in compliance with the ESA Section 7 per the PBA Consistency Evaluation Forms.

The impact summaries listed below consider the threatened, endangered, and special-status species–specific BMPs identified in Tables 2-3 and 2-4 and additional measures outlined in Appendix K. Additional BMPs and mitigation measures outlined in Tables 2-3 and 2-4 for water resources (see Section 3.3), vegetation (see Section 3.6), and wildlife (see Section 3.7) would be applicable. BMPs and mitigation measures presented for wildlife (see Section 3.7) would also be considered generally protective for threatened, endangered, and special-status species and their habitats.

- Complete pre-Project surveys to document wildlife resources and important habitat areas.
- Avoid and minimize impacts to wildlife resources to the extent possible through careful Project layout and design.
- Prepare and implement a BBCS in accordance with USFWS Land-Based Wind Energy Guidelines.
- Revegetate areas of temporary construction impacts to pre-Project conditions to restore wildlife habitat.

3.8.2.2 Switchyard

Sections 3.8.2.2.1 through 3.8.2.2.5 describe the species identified in the USFWS IPaC report that could occur in the proposed Project area and the Switchyard's potential effects. Section 3.8.2.2.6 describes impacts to the species of special concern, including prairie grouse and eagles.

3.8.2.2.1 RUFA RED KNOT

The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would be in compliance of conservation measures outlined within the PBA for the rufa red knot (see Appendix K). Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry standards (APLIC 2012) for the life of the Project. WAPA has determined the Proposed Action may affect but is not likely to adversely affect the rufa red knot.

3.8.2.2.2 PIPING PLOVER

The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would be in compliance of conservation measures outlined within the PBA for the piping plover (see Appendix K). Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry standards (APLIC 2012) for the life of the Project. WAPA has determined the Proposed Action may affect but is not likely to adversely affect the piping plover.

3.8.2.2.3 WHOOPING CRANE

The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would be in compliance with conservation measures outlined within the PBA for the whooping crane (see Appendix K). Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry standards (APLIC 2012) for the life of the Project. A whooping crane monitoring and contingency plan (see Appendix L) has also been developed to minimize potential impacts to whooping cranes during construction and operation of the Project. WAPA has determined that the Proposed Action may affect but is not likely to adversely affect the whooping crane.

3.8.2.2.4 NORTHERN LONG-EARED BAT

The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would be in compliance of conservation measures outlined within the PBA for the NLEB (see Appendix K). WAPA has determined the Proposed Action may affect but is not likely to adversely affect the NLEB.

3.8.2.2.5 MONARCH BUTTERFLY

Approximately 7 acres of potential prairie habitat that may include milkweed would be permanently disturbed by the construction and operation of the Switchyard. This disturbance would have a minor impact to habitats with the potential to contain milkweed, and WAPA has determined the Proposed Action may affect but is not likely to adversely affect the monarch butterfly.

3.8.2.2.6 SPECIES OF SPECIAL CONCERN

Loss and fragmentation of grasslands could detrimentally affect species of special concern, such as prairie grouse. Approximately 7 acres of Northwestern Great Plains Mixedgrass Prairie would be temporarily and permanently impacted by the Switchyard. This grassland in the Switchyard is mapped as broken grassland. The overall disturbance to wildlife species and habitat would be minor.

The Switchyard avoids the top two habitat tiers of both sharp-tailed grouse and greater prairie-chicken habitat as defined by SDGFP (2023).

The Switchyard's small size and lack of large aerial components minimizes its impact to bird species of special concern, including bald and golden eagles. The BBCS would outline the design features implemented that would comply with the APLIC recommendations to avoid and minimize impacts from electrocution hazard and transmission line collision. Because of these conservation measures the impact to bird species of special concern, including eagles, from the Switchyard would be negligible.

3.8.2.3 Wind Facility

Sections 3.8.2.1 through 3.8.2.5 describe the species identified in the USFWS IPaC report that could occur in the proposed Project area and the Wind Facility's potential effects.

3.8.2.3.1 RUFA RED KNOT

Because the rufa red knot has not been observed or known to be in the proposed Project area or vicinity, there is negligible risk of direct or indirect impacts to the rufa red knot. The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would be in compliance of conservation measures outlined within the PBA for the rufa red knot (see Appendix K). Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry standards (APLIC 2012) for the life of the Project. WAPA has determined the Proposed Action may affect but is not likely to adversely affect the rufa red knot.

3.8.2.3.2 PIPING PLOVER

There is limited to no suitable piping plover habitat within the proposed Project area (Piorkowski et al. 2023). Although piping plovers can be found to occur within open water land cover types, the proposed Project area is made up of less than 1% open water. Philip Wind has also committed to turbine location setbacks identified in Table 1-1 to minimize the risk of impact to the piping plover and associated habitat, resulting in a negligible risk of direct or indirect impacts to piping plovers. The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would be in compliance of conservation measures outlined within the PBA for the piping plover (see Appendix K). Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry standards (APLIC 2012) for the life of the Project. WAPA has determined the Proposed Action may affect but is not likely to adversely affect the piping plover.

3.8.2.3.3 WHOOPING CRANE

According to the predicted habitat use model, there is a negligible risk that whooping crane would use the proposed Project area during the migration period, resulting in a risk of direct or indirect impact to whooping crane consistent with that disclosed in the UGP PEIS. The PBA Consistency Evaluation Forms

were completed and accepted by the USFWS, and the Project would be in compliance of conservation measures outlined within the PBA for the whooping crane (see Appendix K). Invenergy has agreed to contribute funding to a third-party entity to complete 5 acres of wetland easement mitigation, estimated at a cost of $3,637 per acre, to adhere to the mitigation requirements outlined in the whooping crane PBA consistency evaluation forms. The third-party mitigation provider would be responsible for using the funding to protect wetlands within the 95% whooping crane migration corridor of South Dakota in perpetuity, and these may include existing, restored, or created wetlands. Documentation of funding by the Project to the third-party mitigation provider would be provided to WAPA prior to Project interconnection. A whooping crane monitoring and contingency plan (see Appendix L) has also been developed to minimize potential impacts to whooping cranes during construction and operation of the Project. Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry standards (APLIC 2012) for the life of the Project. WAPA has determined, pursuant to the ESA, that the Proposed Action may affect but is not likely to adversely affect the whooping crane.

3.8.2.3.4 NORTHERN LONG-EARED BAT

It is unlikely that NLEB would migrate through the proposed Project area, given the distance from the nearest known hibernaculum, but the main risk to NLEB is operating turbines. Turbines have been sited outside a 0.5-mile buffer from connected NLEB habitats. Philip Wind has committed to feather turbine blades below the manufacturer's cut-in speed (winds of 3 meters per second) during active bat season (April 1–October 31), and to feather turbine blades below an increased cut-in speed of 5 meters per second from 0.5 hour before sunset to 0.5 hour after sunrise during the fall migration period (August 15–October 15). Based on these facts and the minimization commitments, there is a negligible risk of direct or indirect impacts to NLEB. The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would be in compliance of conservation measures outlined within the PBA for the NLEB (see Appendix K). The Project is committed to 1 year of postconstruction monitoring. Additionally, the removal of any individual trees necessary for the placement of infrastructure would be minimal in scope, would only occur outside of the migration and summer seasons (November 1–March 30), and would only involve trees determined to constitute unoccupied habitat. WAPA has determined the Proposed Action may affect but is not likely to adversely affect the NLEB.

3.8.2.3.5 MONARCH BUTTERFLY

Approximately 234 acres of prairie habitat would be temporarily disturbed by the construction and operation of the Wind Facility. Approximately 13 acres of prairie habitat would be permanently disturbed by the construction and operation of the Wind Facility. This disturbance would have a negligible impact to habitats with the potential to contain milkweed, and WAPA has determined the Proposed Action may affect but is not likely to adversely affect the monarch butterfly.

3.8.2.3.6 SPECIES OF SPECIAL CONCERN

Loss and fragmentation of grasslands described above can negatively impact species of special concern, including prairie grouse. Approximately 218 acres of Northwestern Great Plains Mixedgrass Prairie would be temporarily impacted, and approximately 12 acres would be permanently impacted. Approximately 15 acres of Northwestern Great Plains Riparian Herbaceous would be temporarily impacted, and approximately 1 acre would be permanently impacted. This level of permanent disturbance to prairie habitats in the area would be considered negligible, and impacts to species of special concern from habitat loss or fragmentation would also be considered negligible.

The Wind Facility avoids the top two habitat tiers of both sharp-tailed grouse and greater prairie-chicken habitat as defined by SDGFP (2023).

During Wind Facility construction and O&M, direct wildlife mortality may result from collisions with vehicles, aboveground gen-tie lines, or turbines. Impacts to eagles would be consistent with those identified in the UGP PEIS.

3.8.2.4 Special-Status Species Conclusion

Section 5.6.1.4 – Threatened, Endangered, and Special Status Species of the UGP PEIS describes potential impacts that could occur to threatened, endangered, and special-status species in the UGP Region during a typical wind energy project's life cycle. Section 5.6.2.6 – Threatened, Endangered, and Special Status Species of the UGP PEIS finds that the BMPs and mitigation measures presented in section 5.6.2 – BMPs and Mitigation Measures of the UGP PEIS for addressing potential effects on ecological resources would also be considered generally protective of many sensitive species and habitats. In conjunction with the UGP PEIS, a PBA was prepared under Section 7 of the ESA to address potential impacts of wind energy development to federally listed, candidate, and proposed threatened or endangered species within the UGP Region. The UGP PBA identified programmatic avoidance criteria and species-specific minimization measures that would be requested of applicants to address those impacts, and it presents determinations regarding the potential for adverse effects on federally listed, candidate, or proposed species if the required avoidance criteria and minimization measures are implemented. These measures are summarized in Table 2.3-2 of the UGP PEIS.

Five federally listed species were identified with the potential to occur in the Project area, including rufa red knot, piping plover, whooping crane, NLEB, and monarch butterfly. There is low potential for occurrence of these species in the proposed Project area, with the exception of monarch butterfly, which has a moderate potential to occur (Piorkowski et al. 2023). The Project has committed to the programmatic avoidance criteria and species-specific minimization measures identified in the UGP PBA, and WAPA has reached concurrence from the USFWS through a determination of "not likely to adversely affect" (see Appendix K). Based on the lack of presence (rufa red knot), negligible suitable habitat (piping plover), negligible risk according to predicted habitat use model (whooping crane), long distance to known hibernaculum (NLEB), and negligible impact to habitats with milkweed (monarch butterfly), along with the Project's commitment to minimize impacts to these species by following the programmatic avoidance criteria and species-specific minimization measures found in the PBA and implementing BMPs and mitigation measures in Section 5.6.2 – BMPs and Mitigation Measures of the UGP PEIS, these impacts would be consistent with the analysis and findings in the UGP PEIS and the Project would not result in new or additional significant impacts than described in the UGP PEIS.

In addition, sharp-tailed grouse and greater prairie-chicken are identified as species of special concern. Approximately 20 acres of potential prairie grouse habitat (Northwestern Great Plains Mixedgrass Prairie) would be permanently disturbed out of a total 25,856 acres in the Project area (0.08% of available habitat in the Project area would be permanently affected). Given the small amount of permanent disturbance to potential prairie grouse habitat and the Project's commitment to minimize impacts by following the BMPs and mitigation measures in Section 5.6.2 – BMPs and Mitigation Measures of the UGP PEIS, these impacts would be consistent with the analysis and findings in the UGP PEIS, and the Project would not result in new or more severe significant impacts than described in the UGP PEIS.

3.8.3 Environmental Consequences: No Action Alternative

Under the No Action Alternative, the Project would not be developed, and impacts to threatened, endangered, and special-status species would continue at existing levels.

3.9 VISUAL RESOURCES

3.9.1 Existing Conditions

Visual and scenic resources within the UGP region are discussed in Section 4.7 – Visual Resources of the UGP PEIS. Rangeland, cropland, large open vistas, and gently rolling topography visually dominate the proposed Project area landscape. Visual impacts to the landscape attributable to the Project would depend on the extent to which the existing landscape is already altered from its natural condition, the number of viewers (i.e., residents, travelers, visiting recreational users, etc.) within visual range of the area, and the degree of public or agency concern for the landscape. Agriculture is the dominant land use with large, geometric agricultural plots occupying most of the proposed Project area. Several occupied residences are scattered throughout the proposed Project area, and a few other rural residences are adjacent to, but outside, the proposed Project area. South Dakota Highway 73 is the only major transportation corridor intersecting the proposed Project area from north to south; however, South Dakota Highway 34 directly abuts the northern edge of the proposed Project area and would likely experience visual impacts despite being outside the proposed Project area. In addition to these major roadways, a number of rural roads bisect the proposed Project area. The current landscape also includes numerous lakes and reservoirs, a cemetery, roadside ditches, and existing transmission lines.

The nearest designated scenic resources to the proposed Project area are the southwest corner of the Native American Scenic Byway located 35 miles to the northeast, Minuteman Missile National Historic Site located 25 miles south, Badlands Loop Scenic Byway beginning 25 miles to the southwest, and Badlands National Park located 35 miles southwest.

3.9.1.1 Shadow Flicker

Shadow flicker occurs when wind turbine blades pass in front of the sun to create reoccurring shadows. Such shadows occur only under very specific conditions, including sun position, wind direction, time of day, and other similar factors. Shadow flicker becomes less noticeable with increasing distance from a wind turbine, and it is generally accepted that flicker becomes imperceptible beyond approximately 4,920 feet (approximately 0.9 mile) (see Appendix M). At such distances, shadow flicker is typically caused only at sunrise or sunset, when cast shadows are sufficiently long.

No regulations regarding shadow flicker have been identified in the state of South Dakota. Additionally, Haakon County has no published ordinances regarding shadow flicker limits; however, effects on nearby residences or other sensitive viewing locations would be minimized through considerations during the siting process (see Section 3.9.2).

3.9.2 Environmental Consequences: Proposed Action

3.9.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. These measures would reduce visual impacts, which are typically addressed during the siting process. The impact summaries below consider the visual resources–specific BMPs, including the following (see Appendix O and Table 2-3 for more detail on these BMPs):

- Wind turbines should be sited properly to eliminate shadow flicker effects on nearby residences or other highly sensitive viewing locations, or reduce them to the lowest achievable levels, as calculated using appropriate siting software and procedures. Accurately determined shadow

flicker estimates should be made available to stakeholders in advance of Project approval. If turbine locations are changed during the siting process, shadow flicker effects should be recalculated and made available to potentially affected stakeholders.

- Wind turbines should exhibit visual uniformity in the shape, color, and size of rotor blades, nacelles, and towers.

3.9.2.2 Switchyard

Construction activities could result in visual impacts from vegetation clearing and grading; road building or upgrading; construction and use of staging areas and laydown yards; construction of facilities; vehicular, equipment, and worker presence and activity; dust; and emissions. In general, construction visual impacts would vary in frequency, duration, and location throughout construction. There would be periods of intense activity followed by periods with less activity and associated visual impacts would vary in accordance with construction activity levels. Site monitoring, adherence to standard construction practices, and restoration activities would reduce many of these potential construction impacts. In addition, vehicular activity would be minimal once the Switchyard reaches commercial operations. Visual impacts from construction of the Switchyard would cease once the Switchyard becomes operational. As a result, permanent visual impacts in the proposed Project area would be minor.

3.9.2.3 Wind Facility

In particular, because of the large size of wind turbine towers, blades, and other components, the transport and installation of wind turbines are visually conspicuous activities during construction (transport and installation would cease at the end of construction).

The primary direct visual impacts associated with operation of the Wind Facility would result from the introduction of the numerous vertical lines of the up to 95 wind turbines into the generally strongly horizontal landscape found in the proposed Project area. The proposed gen-tie line would also be a new visual feature, but impacts would be similar to those of the existing transmission lines in the proposed Project area. To minimize visual impacts, the Wind Facility has been designed in accordance with SDPUC ordinances.

Turbine marker lights and other lighting on the facilities would also result in visual impacts. To minimize visual impacts of the Wind Facility and in accordance with FAA regulations, the towers would be painted off-white to reduce potential glare and minimize visual impact. If required by the FAA, Philip Wind Partners would install an aircraft detection lighting system on turbines. Aircraft detection lighting systems involve the installation of radar units around the perimeter of the Wind Facility. When the radar does not detect an aircraft, it sends a signal to the wind turbine lighting that keeps the light off. When the radar detects an aircraft, it stops sending that signal and the wind turbine lighting activates. Therefore, visual impacts would be increased for a short amount of time when an aircraft is detected.

The construction and operation of the Wind Facility would result in visual impacts. However, the magnitude of the visual impacts associated with the Wind Facility would depend on many factors, including distance of the proposed facility from viewers, weather and lighting conditions, the presence and arrangements of lights on the turbines and other structures, and viewer attitudes. Viewer attitudes are very subjective, and their reactions to visual changes may be influenced by several nonvisual factors, such as perceptions of renewable energy and wind power and financial considerations.

Based on the analysis in the UGP PEIS, visual impacts would dominate the views of casual viewers out to 3 to 5 miles; this area would include rural residents and travelers along South Dakota Highways 73 and 34. Within the areas out to 10 to 12 miles, the Wind Facility would be prominent to the casual viewer but

would not dominate the view; this area would include the same categories of viewers. The UGP PEIS indicates that viewers from a distance of 15 miles or greater would have much smaller impacts; 15 miles is the approximate distance from the town of Philip to the southern edge of the Wind Facility. Again, according to the UGP PEIS, turbines with a total height of approximately 650 feet would be visible up to approximately 30 miles away.

Decommissioning impacts would be the same or fewer than those described for construction. Temporary visual impacts would occur when removing infrastructure. However, once the Wind Facility is decommissioned, visual resources would return to pre–Wind Facility conditions. Permanently impacted land would be restored to pre–Wind Facility land use.

3.9.2.3.1 SHADOW FLICKER

Additional potential visual impacts from operation of the Wind Facility could result from shadow flicker, which occurs when the sun is low in the sky, creating long shadows from the rotating turbine blades. Philip Wind Partners has conducted and published a shadow flicker study. Results of the study demonstrate that the Wind Facility could be operated with minimal disturbance to sensitive receptors (see Appendix M). Currently, Haakon County has no published shadow flicker regulations; however, in accordance with SDPUC ordinances, shadow flicker effects would be minimized to the extent feasible through modeling, analysis, and proper turbine siting.

The Shadow Flicker Study surveyed an area out to 1.25-mile surrounding turbines to be conservative of the 0.9-mile area of perception. In total, 16 potential receptors (inhabited residences, schools, hospitals, churches, and cemeteries) were identified within the area surveyed (see Appendix M). In total, 10 of the 16 receptors are owned by participating landowners (see Appendix M). Results from the Shadow Flicker Study are based on the potential for 95 turbine locations. If all 95 turbine locations were constructed, 11 potential receptors would be expected to receive between 0 and 10 hours of annual shadow flicker (three nonparticipating), three between 10 and 20 annual hours (two nonparticipating), and two expected between 20 and 30 annual hours (one nonparticipating). The average annual sunlight hours in South Dakota are approximately 2,900 hours (Turbine Generator 2018). With this information, the 11 receptors that would receive up to 10 hours of shadow flicker annually represents 0.34% of annual sunlight hours. The three receptors receiving up to 20 hours of shadow flicker annually represents 0.69% of annual sunlight hours, and the two receptors expected to receive up to 30 hours of shadow flicker represents 1.0% of annual sunlight hours. Shadow flicker from the Wind Facility has been minimized through siting and design to be limited in duration and area of effect. In addition, the shadow flicker that remains would be spread across many days, where only a small number of minutes of shadow flicker would be encountered each day. Shadow flicker could be further mitigated using window blinds and/or landscape screening.

3.9.2.4 Visual Resources Conclusion

Section 5.7 – Visual Resources of the UGP PEIS describes the potential visual impacts that could occur from wind energy projects, including alteration of the landscape and shadow flicker. The proposed Project is in an area where rangeland, cropland, large open vistas, and gently rolling topography visually dominate the landscape. Based on the analysis in the UGP PEIS, visual impacts of a wind energy facility could dominate the views of casual viewers out to 3 to 5 miles. It would be prominent to the causal viewer out to 10 to 12 miles but would not dominate the view. Areas within 10 to 12 miles of the proposed Project area include rural residents and travelers along South Dakota Highways 73 and 34. The UGP PEIS indicates that viewers from a distance of 15 miles or greater would have lesser visual impacts. The town of Philip is located approximately 15 miles to the southern edge of the Wind Facility, and the nearest designated scenic resource to the proposed Project area is 25 miles away.

Shadow flicker has been minimized through siting and design to be limited in duration and area of effect. In addition, the shadow flicker that remains would be spread across many days, where only a small number of minutes of shadow flicker would be encountered each day.

The applicant has committed to implementing BMPs derived from the UGP PEIS (see Appendix O) and using turbines that exhibit visual uniformity in the shape, color, and size of rotor blades, nacelles, and towers.

The proposed impacts to visual resources align with those discussed in the UGP PEIS, therefore the Project would not result in new or more severe significant impacts than described in the UGP PEIS.

3.9.3 Environmental Consequences: No Action Alternative

The No Action Alternative would have no impact to visual resources, and existing activities would continue.

3.10 CULTURAL RESOURCES

Cultural resources can include different site types, including archaeological, historical, and architectural sites, that may or may not be eligible for the National Register of Historic Places (NRHP). Cultural resources can also include properties of traditional religious and cultural significance (PTRCS), which are locations of traditional cultural or religious importance to Native American Tribes. In most cases, cultural resources are unique, fragile, and nonrenewable. Cultural resources that meet the eligibility criteria for the NRHP are characterized as "historic properties" under the NHPA. *Historic properties*, as defined in the NHPA [54 United States Code 300308], consist of any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP, including artifacts, records, and material remains related to such a property or resource. Historic Properties can consist of any historic or prehistoric district, site, building, structure, or object (usually) over 50 years of age.

The UGP PEIS provides a brief overview of the cultural context of what is known about the settlement and past use of the Great Plains region; however, to identify new or previously recorded cultural resources eligible or potentially eligible for the NRHP, a cultural resource survey was conducted in 2018 within the original APE for the Project. A second cultural resource survey was completed in 2023 for the updated APE. The APE is defined in 36 CFR 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." The direct APE includes the locations where project infrastructure will be built, such as turbine pads and access roads, as well as areas of temporary disturbance such as laydown yards. The indirect APE includes locations where project infrastructure might visually, or through other means, alter the characteristics and impact the integrity of a cultural resource and its eligibility for NRHP listing. In accordance with requests from the South Dakota State Historic Preservation Office (SHPO), the indirect APE has been defined as a 1-mile buffer around the transmission line, and a 2-mile buffer around each turbine location (actual and alternative).

3.10.1 Existing Conditions

Cultural resource surveys were initiated in 2023 for all areas that would be physically impacted by the Project, including the footprints and small buffers around the turbine pads, access roads, gen-tie line, associated facilities, and temporary work areas. In addition, an architectural survey was completed within a 2-mile buffer around each turbine location to identify historic properties that could be visually impacted

by the undertaking. The field surveys were concluded and consultation with South Dakota SHPO as part of WAPA's NHPA Section 106 consultation will be completed by the publication of the final EA.

3.10.1.1 Records Search

In 2023, BCA conducted a search of the South Dakota SHPO files for the updated direct APE to identify previously recorded archaeological resources and previously conducted cultural resource surveys within a 2-mile buffer of the direct APE. The search identified 10 previously recorded cultural resources: seven sites and three isolated finds comprising Native American Tribal and historic Euro-American artifact scatters, foundations, a well, a dump, and a farmstead. One Euro-American artifact scatter site is considered eligible for the NRHP. Two sites and both isolated finds are determined not eligible for the NRHP. The remaining five sites have not been evaluated for the NRHP.

The file search also identified 12 previous cultural resource surveys in the 2-mile buffer of the direct APE. These surveys were conducted for power, telecommunication, and pipeline projects, and six intersect the direct APE.

A search of the SHPO files for architectural resources within the 2-mile buffer identified three previously recorded historic-age structures, comprising a barn, a fence, and a series of destroyed buildings. All three sites are considered not eligible for the NRHP.

None of the previously recorded cultural resources documented within the 2-mile record search radius surrounding the proposed Project area are located within the direct APE. Consequently, as the Project is currently planned, no previously recorded cultural resources are to be directly impacted by the Project.

3.10.1.2 Field Survey and Reporting Methods

3.10.1.2.1 LEVEL III PEDESTRIAN INVENTORY

Archaeologists initiated Level III pedestrian inventory in fall 2023 in the direct APE (survey area) to meet the South Dakota SHPO as well as any additional Tribal Historic Preservation Office (THPO) survey requirements of the participating TCSs (BCA 2023). The surveys were completed in November 2023, and a summary of the preliminary findings of these studies is provided below. The results and outcomes from WAPA's consultation with the South Dakota SHPO will be provided in the final EA. The proposed survey area encompasses approximately 1,584 acres and serves as the maximum extent of the direct APE.

The survey area consists of blocks mapped over the center of the proposed turbines and associated pads, O&M building, substation/switchyard, and the laydown yards/staging areas, along with corridors mapped over the center of the proposed collection lines, access roads, and transmission lines.

The survey areas were inventoried by BCA archaeologists walking parallel linear pedestrian transects 15 m or less apart, based on terrain and on the probability for the presence of cultural resources. Throughout the survey, field observations were recorded as field notes, and digital photographs were taken. During the survey, when a cultural resource was encountered, the location was marked with pin flags, and the surrounding area was intensely scrutinized to determine the nature and extent of the resource. The resource was then mapped.

Shovel test probes were conducted at newly documented archaeological sites and isolated finds to determine the presence of intact subsurface deposits and/or to define the extent of the cultural resource boundary. The number and placement of the shovel test probes were determined by factors encountered during the documentation of the resource, such as features, thin soils, heavy erosion, topography, or the presence of pre-Holocene gravels on the surface. All soil excavated from the shovel test probes was

screened for cultural material. No cultural material was collected. As all shovel test probes were negative for cultural material at each cultural resource, the resource boundaries were thus defined by the surface expression of the resources, whether as a site or isolated find, and the resources were evaluated for NRHP eligibility.

A cultural resource inventory report is being prepared detailing the results of the Level I records search and the Level III pedestrian inventory and providing recommendations regarding potential site NRHP eligibility. The results of the PTRCS inventory will also be provided. This report will be submitted to South Dakota SHPO by WAPA in the consultation process.

3.10.1.2.2 PTRCS INVENTORY

Several federally recognized Native American Nations indicated to WAPA that they were interested in consulting on the Project, as identified in the initial project scoping in 2018. As a result, WAPA will consult with the interested THPOs for the duration of the Project. TCSs from the Rosebud Sioux Tribe, the Standing Rock Sioux Tribe, the Cheyenne River Sioux Tribe, and the Santee Sioux Nation previously participated in the 2018 cultural resources survey, during which time no Tribal cultural resources were identified by the TCSs. Interested Tribes were invited again to participate in the 2023 Level III pedestrian inventory to assist the archaeologists and review the updated Project area for potential PTRCSs. Four federally recognized Tribes participated in the 2023 surveys.

3.10.1.2.3 RECONNAISSANCE ARCHITECTURAL INVENTORY

An architectural inventory was conducted in fall 2023. The reconnaissance architectural inventory was performed by completing a South Dakota literature review for architectural sites within the indirect APE, which inherently includes the direct APE, as well as by reviewing aerial imagery and USGS topographic maps. Fieldwork was then conducted from public roads, including a preliminary evaluation of each standing building or structure and collecting photographs of each property within the indirect APE. The purpose of the architectural inventory was to photographically document architectural buildings and structures within the indirect APE. The South Dakota SHPO requested an architectural assessment of standing structures within the indirect APE. The field efforts for this survey were completed in fall 2023, and a summary of the preliminary findings is provided below. WAPA will submit the final reports and consult with SHPO for concurrence with the final determinations.

Upon completion of the reconnaissance fieldwork, each building and structure was evaluated by an architectural historian to determine its age and NRHP eligibility based on its potential significance and integrity. For each property identified as historic in age (i.e., of 45 years of age or older), new structure and bridge records will be added to the South Dakota SHPO's Cultural Resource Geographic Research Information Display online database (BCA 2023).

The assessment followed the guidance presented in the 1994 Homesteading and Agricultural Development Context, which states that "[a]n agricultural property is an interrelated set of buildings, structures, and archaeological features, all of which are part of a production system," and "[t]herefore, whenever possible, a building, structure or archaeological feature should be evaluated as part of a whole, rather than individually" (Brooks and Jacon 1994:31; BCA 2023).

Additionally, a reconnaissance architectural inventory report is being prepared and will detail the findings for any NRHP-eligible or unevaluated architectural resources within the indirect APE. For architectural sites found during the inventory that are potentially listed in the NRHP, the report will include recommendations regarding site eligibility. This report will be submitted to South Dakota SHPO when complete.

3.10.1.3 Field Survey Results

3.10.1.4 Level III Pedestrian Inventory Results

In November 2018, archaeologists from BCA and TCSs from the Rosebud Sioux Tribe, the Standing Rock Sioux Tribe, the Cheyenne River Sioux Tribe, and the Santee Sioux Nation completed joint archaeological and Tribal surveys. No previously recorded cultural resources were revisited because none were present in the direct APE. No previously unrecorded cultural resources were identified during the 2018 survey.

Currently, Philip Wind Partners is working with a third-party archaeological contractor (BCA), who conducted a Level III pedestrian survey, a PTRCS inventory, and a visual analysis in 2023. The field efforts have concluded recently, and a summary of the preliminary results is provided below. During the intensive pedestrian survey, seven cultural resources were encountered, consisting of three historic sites (39HK0182, 39HK0183, 39HK0184) and four precontact isolated finds (39HK0089, 39HK0095, 39HK0180, and 39HK0181). All of these sites lacked integrity or significance and were recommended as not eligible for NRHP listing. No PTRCSs were identified by the TCSs during the survey.

3.10.1.5 Reconnaissance Architectural Inventory Results

The reconnaissance architectural survey commenced after identifying potential architectural locations using topographic maps and satellite imagery. In total, 75 locations that were or appeared to be architectural sites were investigated in accordance with SHPO reconnaissance survey requirements and photographed from the public right-of-way. Of these 75 locations, 14 had no remaining standing structures, 20 were entirely modern, two were not visible from the public right-of-way and were not recorded or updated following guidance from the SHPO, and 39 contained recordable, historic architectural structures. None of the architectural sites were within the survey area. Of the 75 locations evaluated by BCA, the 39 that possessed buildings and structures of historic age were recorded with the South Dakota SHPO. In total, five of these sites possessed buildings or structures that were evaluated by BCA as NRHP-eligible or potentially NRHP-eligible, unevaluated. Upon completion of the reconnaissance fieldwork, each building and structure was evaluated by an architectural historian to determine its age and NRHP eligibility based on its potential significance and integrity. A reconnaissance architectural inventory report is being prepared that will detail the findings for the eligible or unevaluated architectural resources within the indirect APE and include recommendations regarding potential site eligibility.

3.10.2 Environmental Consequences: Proposed Action

3.10.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. These measures would reduce impacts to cultural resources. The impact summaries below consider the cultural resources–specific BMPs, including the following (see Appendix O for more detail on these BMPs):

- The appropriate federal agency should consult with federally recognized Native American governments early in the planning process for a wind energy development to identify issues and areas of concern. Consultation is required under the NHPA. Consultation is necessary to establish whether the project is likely to disturb traditional cultural properties, affect access rights to

particular locations, disrupt traditional cultural practices, affect trust resources such as eagles, and/or visually impact areas important to the Tribe(s).

- The presence of archaeological sites and historic properties in the APE should be determined on the basis of a records search of recorded sites and properties in the area and/or an archaeological survey. The SHPO is the primary repository for cultural resource information.
- Cultural resources discovered during construction should be brought to the attention of the responsible federal agency immediately. Work should be immediately halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation plans are being developed.

3.10.2.2 Switchyard

Based on the results of the 2023 records search and field survey, no previously recorded cultural resources were documented within the 2-mile record search radius surrounding the current direct APE. The Level III survey identified seven archaeological sites, consisting of three historic sites and four precontact isolates. All of these sites will be recommended as not eligible under NHRP. No PTRCSs were identified. During the reconnaissance architectural inventory, several sites were identified within the indirect APE. WAPA, in consultation with the South Dakota SHPO, will determine if there are any adverse effects on cultural resources from the Project.

Decommissioning impacts would be the same or fewer than those described for construction.

3.10.2.3 Wind Facility

Based on the results of the 2023 records search and field survey, no previously recorded cultural resources have been documented within the 2-mile record search radius surrounding the current direct APE. The Level III survey identified seven archaeological sites, consisting of three historic sites and four precontact isolates. All of these cultural resources are recommended as not eligible for NHRP listing. No PTRCSs were identified. During the reconnaissance architectural inventory, several sites were identified within the indirect APE. WAPA, in consultation with the South Dakota SHPO, will determine if there are any adverse effects on cultural resources from the Project.

Decommissioning impacts would be the same or fewer than those described for construction.

3.10.2.4 Cultural Resources Conclusion

Section 5.9 – Cultural Resources of the PEIS summarizes the potential impacts that could occur to cultural resources during a typical wind energy project's life cycle and the possible mitigation measures. Determining the appropriate mitigation measures must be completed on a project specific basis following identification of cultural resources. Preliminary findings during desktop research identified 10 cultural resource sites and three architectural sites; none of these resources are located within the Project APE. The Level III field survey identified three historic sites and four precontact isolates. All of these cultural resources are recommended as not eligible for NRHP listing. No PTRCSs were identified during field surveys with participation from TCSs. During the reconnaissance architectural inventory, several sites were identified within the indirect APE. Given the site-specific assessments completed to identify cultural resources, and a commitment by the Project to observe the applicable mitigation measures in Section 5.9.1.6 of the PEIS, including consultation under Section 106 of the NHPA to be overseen by WAPA, the cultural resources findings and analysis are consistent with the UGP PEIS, and no new or more severe significant impacts are anticipated. If affected cultural resources are identified in subsequent

analysis, impacts to those resources will be avoided or managed in coordination with the SHPO and WAPA.

3.10.3 Environmental Consequences: No Action Alternative

The No Action Alternative for the Project would have no impact to cultural resources, and existing activities would continue.

3.11 SOCIOECONOMICS

3.11.1 Existing Conditions

Section 5.10 – Socioeconomics of the UGP PEIS breaks down the socioeconomic environment potentially impacted by the development of wind resources in the UGP region. The UGP PEIS identifies 10 key measures of economic development: employment, unemployment, personal income, sales tax revenues, income tax revenues, population, vacant rental housing, state and local government expenditures, state and local government employment, and recreation. The proposed Project area lies completely within Haakon County; therefore, Haakon County was the only county analyzed for the Project. Table 3-23 lists the key measures of economic development applicable to the proposed Project area. Data for this section compare the 10 measures for Haakon County to South Dakota. South Dakota does not have state income tax, so this measure was not included in the table. The median household income is $51,016 in Haakon County, lower than the state median income at $63,920. The 2021 unemployment rate is 2.8% in Haakon County which is slightly lower than the state at 3.1% (Headwaters Economics 2021).

Table 3-23. Socioeconomic Key Measures for Haakon County and South Dakota (2021)

Socioeconomic Key Measures	Haakon County	South Dakota
Population	1,868 people	895,376 people
Employment	1,605 people (87.5%)	622,335 people (69.5%)
Unemployment rate	2.8%	3.1%
Median household (annual average)	$51,016	$63,920
State sales tax revenues	N/A	$2.7 billion (2022)*
Rental vacancy rate	2%	2%
State and local government expenditures	N/A	$6.8 billion (2021)†
Government employment‡	8.2%; 132 people	13.9%; 86,695 people
Recreation sector total employment (2021)	N/A	430,807 people

Source: Headwaters Economics (2021).
Note: N/A = not applicable to measure and area.
* South Dakota Department of Revenue (2022).
† National Association of State Budget Officers (2022:Table A-1).
‡ Federal, military, state, and local government enterprise.

3.11.2 Environmental Consequences: Proposed Action

3.11.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. No additional separate socioeconomic mitigations were identified in the BMPs of the UGP PEIS.

The Project is projected to create both short-term and long-term positive impacts for the local economy. There would be a temporary increase in the number of construction jobs, in population, and in revenue for local businesses. Construction activities would be short term, and the short-term impacts to local businesses would likely be beneficial. Long-term benefits would include an addition of full-time employment for O&M of the proposed project for approximately 12 employees.

3.11.2.2 Switchyard

Jobs generated from construction of the Switchyard would include grid management, transmission services, and utility services. According to the Bureau of Labor Statistics (BLS), the mean annual wage of maintenance workers in the electric power generation, transmission, and distribution industry is $77,350 (BLS 2021a). The Switchyard would generate $200,000 in direct economic benefits to landowners, local and state governments, and school districts. Private landowners would benefit the most from purchase of the Switchyard land and transmission easement payment.

The Switchyard is projected to a create short-term positive impacts to the local economy. There would be a temporary increase in the number of construction jobs, in population, and in revenue for local businesses. The Switchyard would likely employ nonlocal construction workers to complete the construction of the Switchyard. Workers would commute to the site, so the need for temporary housing would be unlikely. Construction activities would be short term, and the short-term impacts to local businesses would likely be beneficial. Because a full-time employee would not be on-site and routine maintenance would occur intermittently at the Switchyard, there are no long-term impacts expected to the local economy.

3.11.2.3 Wind Facility

In all, 67 short-term contracting and installation jobs are expected to be generated for every 100 MW of installed wind power (Ayee et al. 2008). Therefore, the Wind Facility would generate approximately 201 construction jobs. Additionally, approximately 12 permanent O&M jobs for the Wind Facility will be generated; employees could be from Haakon County or brought in from outside the area, thereby bringing more people into the county to positively contribute to the local economy. Construction of the Wind Facility would include crane operators, specialized transport, concrete and steel foundations, structural engineers, mechanics, construction equipment operators, and wind turbine operators.

The long-term impacts from the Wind Facility would result in permanent economic benefits from lease payments, O&M, and property taxes paid to the local and state governments, as well as local school districts. According to the BLS, the mean annual salary for wind turbine operators in the electric power generation, transmission, and distribution industry is $64,830 per year (BLS 2021b), which exceeds the Haakon County household median income of $51,016. The total economic benefits for O&M are calculated by multiplying the number of O&M employees by the median annual salary. The Wind Facility would generate $3,875,000 total in direct economic benefits to the entities listed above. Table 3-24 shows the estimated direct economic benefits that would be generated by the Wind Facility. Local spending at

businesses during the O&M needs are not included in this table but would have additional benefits. Landowners would benefit the most from lease payments for wind turbines and the associated roads on their private property. These payments would provide a predictable source of income for the lifetime of the Wind Facility, which is approximately 30 years.

Government revenue comes from an annual nameplate capacity tax and production tax. The nameplate capacity tax is equal to $3 per kilowatt multiplied by the generating capacity of the wind energy facility; therefore, the 300-MW Project would generate $900,000 per year. The production tax is calculated by multiplying $0.00045 per kilowatt-hour and is paid annually, and the revenue is deposited into the renewable facility tax fund. The renewable tax fund distributes revenue from nameplate taxes and 20% of the production taxes to the school districts, counties, and organized townships (U.S. Department of Energy 2018). Because the production tax is dependent on kilowatt-hours in real time, the production tax is not incorporated into the total tax revenue in Table 3-24.

Table 3-24. Direct Long-Term Economic Benefits from Wind Facility

Payment	Direct Beneficiary	Approximate Total/Year
Wind lease easement payments*	Project landowners	$2,200,000 per year
O&M	Approximately 12 employees	$778,000 per year
Taxes†	Townships, counties, school districts, and South Dakota	$900,000

* Wind easement payments are based on signed land as of June 2023 and 300 MW of installed turbine capacity and are the average annual value of expected payments over 30 years (payments increase over time; the annual figure is based on expected payments over 30 years divided by 30). If installed turbine capacity is less than 300 MW, payments to landowners would be less than this estimate.

† Taxes from South Dakota nameplate taxes.

A study conducted in 2015 found that there is no statistical evidence that property (home) prices near wind turbines were affected during the postconstruction, post-announcement, or preconstruction periods of time. If effects do exist, they are relatively small (Hoen et al. 2015). Additionally, private property values will increase in wind lease payments if any wind and/or switchyard facilities or associated roads are constructed directly on properties.

The Wind Facility is projected to create both short-term and long-term beneficial impacts for the local economy. There would be a temporary increase in the number of construction jobs, in population, and in revenue for local businesses. The Wind Facility would likely employ nonlocal construction workers to complete the construction of the Wind Facility. Workers would commute to the site, so the need for temporary housing would be unlikely. Construction activities would be short term, and the short-term impacts to local businesses are likely to be beneficial. A relatively small labor force would be required to maintain and operate the Wind Facility, therefore, impacts to the rental housing market or to local government expenditures and employment long term would be negligible.

3.11.2.4 Socioeconomics Conclusion

During construction, the Project would generate an estimated 201 jobs, which would add to the local economy through housing and increased use of restaurants and businesses. During operations, there would be an estimated 12 permanent jobs with an average annual salary of $64,830 to $77,350 per year, which significantly exceed the Haakon County median household income of $51,016. The Project would further generate approximately $4 million per year in direct economic benefits to landowners, local and state governments, and school districts. Based on the analysis of the proposed Project, impacts to the socioeconomic status of Haakon County would likely be beneficial, and any adverse effects would be negligible. Therefore, the proposed Project's impacts to socioeconomics would be less than significant.

3.11.3 Environmental Consequences: No Action Alternative

The No Action Alternative would result in the continuation of agriculture development. This would result in no new jobs for construction or operation periods of the Project and no new tax revenue for Haakon County.

3.12 ENVIRONMENTAL JUSTICE

3.12.1 Existing Conditions

Environmental justice is the equitable treatment of all individuals, regardless of their race, color, national origin, or income in relation to the development, implementation, and enforcement of environmental laws, regulations, and policies. Environmental justice guarantees that everyone receives the same level of protection from environmental health hazards (EPA 2023f). Executive Order 12898 requires federal agencies to put forth their greatest and reasonable effort to identify and address disproportionately adverse human or environmental health effects of their actions on minority and low-income populations. Executive Order 12898 also requires federal agencies to develop a strategy for implementing environmental justice (EPA 2023f).

The entire proposed Project area occupies Haakon County; therefore, to analyze low-income and minority populations, Haakon County is compared to South Dakota. Minority populations are identified by determining the percentage of minority individuals (nonwhite individuals, including Hispanic and Latinx) for Haakon County and South Dakota. Low-income populations are identified by determining the percentage of the population below the poverty level. The Haakon County population is determined minority and/or low income if these populations accounted for 50% or more of the total population or if those populations exceed the state percentage by more than 20 percentage points (i.e., “meaningfully greater than the general population”) (Council on Environmental Quality 1997).

Table 3-25 summarizes minority and low-income population data from Haakon County and South Dakota, derived from Headwaters Economics 2021 Demographic Profiles (Headwaters Economics 2021). The populations in both Haakon County and South Dakota are mostly white, (94.1 and 82.6%, respectively). The percentage of the population in Haakon County living under the poverty level is 16.5%, which is slightly above the state percent of 12.5%. The percentage of the minority population is 5.9%, less than the state average of 17.4%. The populations in the proposed Project area, represented by the Haakon County data, are majority white and above the poverty level. The state has higher proportions of minority and low-income residents.

Table 3-25. Minority and Low-Income Populations (2021)

Location	Total Population	Percentage Minority (%)	Percentage Below Poverty (%)
Haakon County	1,868	5.9%	16.5%
South Dakota	881,785	17.4%	12.5%

Source: Headwaters Economics (2021).

The potential negative impacts associated with the Project were evaluated and analyzed in the UGP PEIS. The issues analyzed were related to air quality, noise disturbances, access to vegetation or animals, visual resources, and a decrease in property values. During Project construction, there would be an increase of fugitive dust and noise production associated with the construction of wind energy facilities and

associated access roads, creating a minor and temporary impact. The visual impact of wind energy generation and auxiliary facilities could also create environmental justice issues, depending on the facility size and proximity to these populations; however, because no environmental justice communities are present in the area, visual impacts and noise disturbances would not disproportionately impact these communities. Wind energy facility development could restrict access to certain animals and vegetation with cultural or religious significance, creating an environmental justice concern; however, Section 3.10.2 states that no cultural resources were identified in the indirect nor direct APE of the Project according to the 2023 Class I survey results. Mitigation measures for air quality, noise disturbances, and visual resources are addressed in their respective sections within this EA (see Sections 3.4, 3.5, and 3.9). Property values in the area are not expected to decrease, and if effects do exist, they would be negligible, as addressed in Section 3.11.2 of this EA. The demographic data analyzed above confirm that minority and low-income populations would not be affected disproportionately.

3.12.2 Environmental Consequences: Proposed Action

3.12.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. No additional separate environmental justice mitigations were identified in the BMPs of the UGP PEIS.

3.12.2.2 Switchyard

No prominent minority or low-income populations are present in Haakon County. The percentage of the minority population falls under South Dakota's average. As noted in Section 3.12.1, the Haakon County population is determined minority and/or low income if these populations accounted for 50% or more of the total population or if those populations exceed the state percentage by more than 20 percentage points. As the percentage of the population below poverty does not exceed 50% or more than 20 percentage points more than South Dakota, no minority or low-income populations would be disproportionately impacted by Switchyard construction, O&M, or decommissioning.

3.12.2.3 Wind Facility

No prominent minority or low-income populations are present in Haakon County. The percentage of the minority population falls under South Dakota's average. As noted in Section 3.12.1, the Haakon County population is determined minority and/or low income if these populations accounted for 50% or more of the total population or if those populations exceed the state percentage by more than 20 percentage points. The percentage of the population below poverty does not exceed 50% or more than 20 percentage points more than South Dakota. No minority or low-income populations would be disproportionately impacted by Wind Facility construction, O&M, or decommissioning.

3.12.2.4 Environmental Justice Conclusion

The Project would not have disproportionately adverse human or environmental health effects on minority or low-income populations. In Haakon County, 16.5% of the population is living under the poverty level, and 5.9% of the population identifies as a member of a minority group. The Project would support the community through significant tax and landowner payments that have the potential to support the economic well-being of the low-income population. The potential effects of wind facilities on minority populations are analyzed in the UGP PEIS, and this Project's impacts are consistent with those

discussed. Therefore, Project impacts would be negligible on minority and low-income populations and are less than significant.

3.12.3 Environmental Consequences: No Action Alternative

The No Action Alternative for the Project would have no impact to environmental justice, and existing activities would continue.

3.13 HEALTH AND SAFETY

3.13.1 Existing Conditions

Section 5.13 – Health and Safety of the UGP PEIS discusses the health and safety impacts construction and operation of wind projects can have on workers and environmental health concerns in the area around the wind power facilities.

3.13.1.1 Electromagnetic Fields

Human-made sources of electric and magnetic fields (EMFs) range in size and intensity from household objects, like cellular telephones, calculators, and microwaves to large electric producing and transmitting structures, such as transmission lines, substations, and wind farms.

EMFs are defined as invisible areas of energy, often referred to as radiation, that are associated with the use of electrical power and various forms of natural and human-made lighting. The strength of EMFs decreases with increased distance from their source (National Institute of Environmental Health Sciences 2023). There have not been substantial scientific conclusions on EMFs tied to adverse health effects in adults to conclude whether or not there is any correlation. In 2002, the International Agency for Research on Cancer, a component of the World Health Organization, reviewed available evidence on static and extremely low frequency EMFs. The group determined that "static electric and magnetic fields and extremely low-frequency electric fields are *not classifiable as to their carcinogenicity to humans*" (World Health Organization International Agency for Research on Cancer 2002:338).

There are currently no state or federal regulations pertaining to a maximum EMF intensity or exposure, but separate guidelines have been issued by the International Commission on Non-ionizing Radiation Protection (1998) and the Institute of Electrical and Electronics Engineers (2002).

3.13.1.2 Noise and Infrasound

General audible noise typically between frequencies of 20 and 20,000 hertz is discussed in further detail in Section 3.5.

Infrasound, sometimes referred to as "low frequency sound," occurs at much smaller frequencies and is typically unable to be heard by the human ear (well below 20 hertz). Sources of infrasound range from very low-frequency atmospheric fluctuations up into the lower audio frequencies. These sources include natural occurrences, industrial installations, and low-speed machinery (Leventhall 2007). High levels of infrasound can be audible (110-plus dBA) and can be made from human machinery or natural processes like ocean waves or volcanoes. The effect of infrasound exposure has been studied vigorously, yielding different results across studies. Testimony filed before the SDPUC found that according to wind turbine models, and after a thorough analysis of scientific research, there is no correlation between infrasound from wind turbines and adverse health effects, including sleep disturbance or vertigo (Roberts 2018).

3.13.1.3 Occupational and Physical Hazards

All wind farms could present potential physical hazards, including mechanical failure, aviation, intentional destructive acts, ice throw from turbine blades, fire, and occupational accidents. The proposed project does not create any additional risk of physical hazard than those inherent to all wind farm developments and is consistent with the conclusions provided in the UGP Wind Energy PEIS.

As stated in the UGP PEIS, mechanical failure is a primary physical safety hazard of wind turbines, which typically occurs when operation exceeds specific turbine model operation parameters. Turbine rotor overspeed would be an example of this extremely rare occurrence, and modern turbine models have safety controls to avoid such incidents. Blade failure is another extremely rare example of mechanical failure, in which turbine blades fail and break from rotor falling to the ground, endangering nearby residents and structures.

Wind farms can be hazardous to aviation, because they contain tall structures with the potential to come into conflict with low-flying aircraft. The FAA guidelines in 14 CFR 77 for the marking and lighting of wind farms require lights that flash white during the day and at twilight and red at night (FAA 2015); terrain, weather, and other location factors allow for adjustments to the manner in which FAA requirements are applied. Wind farm developers are required to file a notice with the FAA for any construction that could present an obstruction to air navigation due to height and/or location relative to airports.

Wind projects may be targeted by intentional destructive acts ranging from vandalism and theft to sabotage and acts of terrorism. Vandalism and theft are far more likely for projects in remote areas that serve relatively small populations. Intentional sabotage or terrorist acts would be expected to target much larger electrical facilities, where a loss of service would have substantial regional impacts. Theft is most likely to involve substation and switchyard equipment that contains salvageable metal (e.g., copper and aluminum) when metal prices are high. Vandalism, on the other hand, is more likely to take place in remote areas and perhaps more likely to involve acts of opportunity (e.g., shooting out transmission line insulators) than premeditated acts.

Ice building up on a wind turbine blade and being thrown off can present a safety hazard. Available data suggest that many factors determine what happens to ice that is thrown from a wind turbine blade. In most instances, ice pieces simply fall from the blade and land on the ground near the base of the tower as the air temperature warms; however, large ice pieces have been thrown a distance from the tower base (Tetra Tech 2007; Wahl and Giguere 2006); a general setback distance of 1.5 times the blade tip height is observed in the industry to avoid ice throw. Ice throw can cause injuries to people and damage to buildings.

Fires have started at wind farm facilities for a variety of reasons, such as electrical shorts, insufficient equipment maintenance, contact with power lines, and lightning. Increased human activity also increases the potential for fires. The International Electrotechnical Commission requires that the design of electrical systems for wind turbine generating systems comply with relevant International Electrotechnical Commission standards.

Common occupational physical hazards present in the proposed Project area are commonplace within any industrial workplace, including slips, trips, and falls, and vehicle accidents. Environmental factors may present hazards as well, including major weather events (e.g., extreme heat/cold, thunderstorms, high winds, blizzards), poisonous plants, venomous snakes, and biting/stinging insects. See Section 3.8 – Health and Safety Aspects of Wind Energy Projects of the UGP PEIS for additional information on physical hazards.

3.13.1.4 Hazardous Materials and Solid Waste

Hazardous materials would unlikely be encountered during Project construction in the proposed Project area. Eight known spills/environmental events and five registered storage tanks are in and around the proposed Project area, and all are either closed or inactive (SD DANR 2023). Solid waste handling and recycling would be conducted in accordance with federal, state, and local regulations. Philip Wind plans to conduct a Phase I Environmental Site Assessment prior to Project construction and would also develop a Spill Prevention Control and Countermeasures plan.

3.13.2 Environmental Consequences: Proposed Action

3.13.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS and the Applicant's additional voluntary environmental protection measures. The impact summaries, in the sections below, consider the health and safety-specific BMPs, which include the following (see Appendix O and Table 2-3 for more detail on these BMPs):

- Conduct all site characterization, construction, operation, and decommissioning activities in compliance with applicable federal and state occupational safety and health standards.
- Develop a Project health and safety program that addresses protection of public health and safety during Project site characterization, construction, O&M, and decommissioning activities.
- If contamination is caused by, or is encountered during on-site construction activity, report the contamination to the SDDANR (SD DANR 2023).

3.13.2.2 Switchyard

3.13.2.2.1 ELECTROMAGNETIC FIELDS

EMFs may exist within the electronic carrying portions of the Switchyard, as well as along the other existing transmission lines. Portions of the Switchyard where such fields may exist are generally not accessible to the general public; however, the public may have greater accessibility to transmission-related fields. EPA recommendations of exposure to EMFs range from 0.5 to 2.5 milliGauss (WAPA and USFWS 2015).

Given that the National Institute of Environmental Health Sciences (2023) reports that EMF levels from a high-voltage transmission line would decrease by over 95% at a distance of 200 feet and given that the nearest residences would be approximately 0.5 mile from the Switchyard, it is expected that any EMFs produced would dissipate across this distance, causing no measurable effect above background levels. Although the Switchyard would create EMFs, there is little scientific consensus on definitive adverse effects from their creation.

3.13.2.2.2 NOISE AND INFRASOUND

There would be no sizeable effects on noise and infrasound as they relate to public health from the construction and operation of the Switchyard. Further consequences due to noise are discussed in Section 3.5.

3.13.2.2.3 OCCUPATIONAL AND PHYSICAL HAZARDS

The Switchyard, as energy infrastructure, may be at risk of being a target of sabotage or terrorism. It is impossible to predict the frequency or severity of terrorism or any act of sabotage. Due to the remote nature and size of the Switchyard, damage or risk to nearby residences (the nearest is approximately 0.5 mile away) would be negligible. Natural events, fire and electric failure present potential risks that need to be minimized as recommended in the UGP PEIS.

Exposure to occupational hazards by the Project staff would be minimal and would consist of many of the same hazards present in other electrical industries. Workers would be around energized systems and would be responsible for handling heavy machinery and vehicles, which would entail additional hazard risks. Occupational hazards within the Switchyard would not be dissimilar to any hazard within the realm of industrial electrical work.

3.13.2.2.4 HAZARDOUS MATERIALS AND SOLID WASTE

The construction of the Switchyard would use hazardous materials and generate solid waste. Hazardous materials, such as fuels and lubricants for equipment, would be handled according to regulations and industry best practices and disposed of at appropriately permitted facilities. Solid waste generated that would not be reused in some beneficial manner would be disposed or managed at a permitted solid waste facility. Although there are eight known spills/environmental events and five registered storage tanks in and around the proposed Project area, all are either closed or inactive (SDDANR 2023); therefore, no impacts are expected to occur.

Switchyard decommissioning impacts would be similar to those described for the construction of the Switchyard. Although decommissioning would entail increased temporary risks to worker safety due to increased activity and temporary increases from hazardous materials and solid wastes, decommissioning of the Project would ultimately remove the operational risks from EMF, physical hazards, and hazardous materials and solid wastes.

3.13.2.3 Wind Facility

3.13.2.3.1 ELECTROMAGNETIC FIELDS

The Wind Facility would produce the greatest amount of EMFs near the substation, gen-tie line, and Basin Electric transmission line. Given that the National Institute of Environmental Health Sciences (2023) reports that EMF levels from a high-voltage transmission line would decrease by over 95% at a distance of 200 feet; given that the nearest residences would be approximately 0.5 mile from the Switchyard, it is expected that any EMFs produced would dissipate across this distance, causing no measurable effect above background levels.

3.13.2.3.2 NOISE AND INFRASOUND

Human-made machinery, such as wind turbines, is tied to the generation of infrasound. Infrasound levels created by contemporary wind turbines are similar to levels made by anthropogenic sources, such as a heartbeat or lungs inhaling (Roberts 2018).

An independent study conducted by a panel of experts for the Massachusetts Department of Public Health and the Massachusetts Department of Environmental Protection found varied evidence to suggest that wind turbines have an annoyance and sleep disturbance effect, but not enough to provide a reliable link on

whether this disturbance was caused by the audible levels of the turbines themselves (Schomer and Pamidighantam 2013).

3.13.2.3.3 OCCUPATIONAL AND PHYSICAL HAZARDS

The creation of any wind farm creates the possibility of many different types of physical hazards, both natural and anthropogenic. Based on the location of the nearest residents and the extreme rarity of mechanical failure or ice throw potential, it does not present a likely risk. Aviation risks will require turbine marking and lighting that is in compliance with the FAA's final marking and lighting plan (FAA 2019) and should not impact commercial aviation safety. Local aviation risks are consistent with the findings in the UGP PEIS. Natural hazards that may present risks for the Wind Facility include earthquakes, intense storms, or tornadoes. Natural events may occur at all stages of the Project lifespan and depending on the severity of the events may cause damages to the facility, creating economic damage and environmental consequences.

Similar to the Switchyard, as energy infrastructure, the Wind Facility may be a more likely target for sabotage or terrorism, both of which are impossible to predict.

Exposure to occupational hazards by the Wind Facility staff would consist of many of the same hazards present in other electrical industries. Workers would likely be around energized systems or at high altitudes and would be responsible for handling heavy machinery and vehicles, which would entail additional hazard risks.

3.13.2.3.4 HAZARDOUS MATERIALS AND SOLID WASTE

The construction of the Wind Facility would use hazardous materials and generate solid waste. Hazardous materials, such as fuels and lubricants for equipment, would be handled according to regulations and industry best practices, and disposed of at appropriately permitted facilities. Any solid waste generated would be disposed of or managed at a permitted solid waste facility. Although there are eight known spills/environmental events and five registered storage tanks in and around the proposed Project area, all are either closed or inactive (SDDANR 2023); therefore, no impacts are expected to occur.

Wind Facility decommissioning impacts would be similar to those described for the construction of the Wind Facility. Although decommissioning would entail increased temporary risks to worker safety due to increased activity and temporary increases from hazardous materials and solid wastes, decommissioning of the Project would ultimately remove the operational risks from EMF, noise and infrasound, physical hazards, and hazardous materials and solid wastes.

3.13.2.4 Health and Safety Conclusion

The UGP PEIS assesses the potential health and safety aspects of wind energy projects (Section 5.13 – Health and Safety), as well as hazardous materials and waste management (Section 5.12 – Hazardous Materials and Waste). There is the potential for Project components, such as the substation and transmission line, to emit electromagnetic fields; however, they dissipate to background levels within 200 feet (National Institute of Environmental Health Sciences 2023). Since there are no residences within 200 feet of these facilities, the impacts of the Project would be negligible. The UGP PEIS also considers the potential impacts of infrasound. The sound levels of the Project would fall within the range of those contemplated within the UGP PEIS, so the effects would be consistent with those analyzed under the UGP PEIS with no new or more severe significant impacts. The UGP PEIS further assesses the occupational and physical hazards associated with the construction and operation of a wind facility, and those expected of this Project would be of a similar nature and would not constitute a new or more severe

significant impact. Finally, the UGP PEIS evaluates the common hazardous materials and waste products associated with construction and operations of a wind facility, and this Project is similarly expected to use and properly manage those resources under relevant regulations and Project permits, so there would be no new or more severe significant impacts. Although the UGP PEIS contemplates health and safety risks, they are consistent with those anticipated for the Project, and therefore, there would be no new or more severe significant impacts.

3.13.3 Environmental Consequences: No Action Alternative

The No Action Alternative would have no impact to health and safety, and existing activities, conditions, and hazards would continue.

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4 CUMULATIVE IMPACTS

The total cumulative impacts related to past, present, and reasonably foreseeable future actions on resources within the UGP region are analyzed in Section 6 – Cumulative Impacts of the UGP PEIS. All cumulative impacts of the Project fall within the scope of cumulative impact analysis in the UGP PEIS. Section 2.4 – Description of Potential Development Scenarios of the UGP PEIS projected an increase of wind energy development in the UGP region through the year 2030, and the Project is consistent with that projection. The geographic scope of the cumulative impacts analysis is dependent on the region of influence (ROI) for each resource. The UGP PEIS defines ROIs as the "encompassing areas of affected resources and the distances at which impacts associated with the preferred alternative may occur." ROIs for the cumulative impact analysis by resource are discussed further in Table 6.1-1 of the UGP PEIS.

Past and present actions are reflected in the affected environment descriptions above in Section 3. These include conversion of native grasslands to pasture and tilled cropland, water impoundments (dammed lakes and ponds), agricultural and rural residential structures, electric transmission and distribution infrastructure, and roadways (paved, gravel, and two-track roads). There are currently no energy conversion facilities that are operating, under construction, or reasonably foreseeable within or adjacent to the proposed Project area. There are also no wind projects proposed or under construction in Haakon County or any adjacent county. No other developments related to large-scale energy development are known to be proposed in the proposed Project area.

The construction and operation of the Project would contribute to cumulative impacts to resources within the UGP region. A summary of cumulative impacts associated with the UGP PEIS's preferred alternative, which the Project is a part of, is provided in Table 6.3-2 of the UGP PEIS. Table 4-1 below specifies the resources that have the potential for cumulative impacts from the Project, and include visual resources, cultural resources, noise, vegetation, wildlife (including special-status species), and land use. These impacts would be avoided, minimized, and mitigated during the construction and operation of the Project through the implementation of BMPs and conservation measures. Other resources are not anticipated to have negative impacts from the Project, or the negative impacts from the Project are anticipated to be negligible, thus not contributing to cumulative impacts.

Cumulative impacts would be minor because of the Applicant's implementation of associated PEIS BMPs and the Applicant's additional voluntary environmental protection measures. The summary of potential cumulative impacts is described in more detail in Table 4-1 below.

Table 4-1. Cumulative Impact Summary for the Proposed Action and No Action Alternative

Alternative	Resources that Could Experience Cumulative Effects	Related Past, Present, and Reasonably Foreseeable Future Activities	Potential Cumulative Impacts
Proposed Action	Visual resources, cultural resources	Distribution and transmission lines Residential and other urban development Roads and highways	The Proposed Action would contribute cumulative impacts to visual resources by increasing contrast with the surrounding landscape. These visual impacts could have a cumulative impact to cultural resources. Impacts would be mitigated by adherence to the PEIS BMPs and the Applicant's additional voluntary environmental protection measures.

Alternative	Resources that Could Experience Cumulative Effects	Related Past, Present, and Reasonably Foreseeable Future Activities	Potential Cumulative Impacts
Proposed Action	Noise	Agriculture Distribution and transmission lines Hunting Residential and other urban development Roads and highways	The Proposed Action would contribute cumulative impacts to noise in, and immediately adjacent to, the proposed Project area by increasing ambient sound over the duration of the Project. Impacts would be mitigated by adherence to the PEIS BMPs and the Applicant's additional voluntary environmental protection measures.
Proposed Action	Vegetation, wildlife; threatened, endangered, and special-status species; land use	Agriculture Distribution and transmission lines Grazing Hunting Residential and other urban development Roads and highways	The Proposed Action would contribute cumulative impacts to vegetation, wildlife; threatened, endangered, and special-status species; and land use around the proposed Project area by disturbing vegetation and occupying land that is adjacent to viable habitat or suitable lands for anthropogenic uses. These impacts are part of the historical trend of undeveloped land transitioning to rural development and agriculture. Impacts would be mitigated by adherence to the PEIS BMPs, the PBA Consistency Evaluation Forms, and the Applicant's additional voluntary environmental protection measures.
No Action	None	Agriculture Distribution and transmission lines Grazing Hunting Residential and other urban development Roads and highways	The No Action Alternative would not contribute to cumulative impacts.

5 CONSULTATION AND COORDINATION

A virtual public scoping meeting was held on Thursday, January 19, 2023, from 5:00 to 7:00 p.m. Mountain Standard Time via the online meeting platform *Zoom*. Announcements about the scoping meeting were published in the local Pioneer Review newspaper and sent out to landowners, stakeholders, and state and federal agencies. Members from WAPA, SWCA, Philip Wind Partners, and 20 individuals from the public attended this meeting.

The public scoping meeting documentation and comments received from agencies and the public regarding the Project are provided in Appendix J.

Upon completion of the scoping meeting, agencies, the public, and stakeholders were invited to review and comment on the scope of the NEPA document during a 30-day public scoping period from January 19 to February 13, 2023. During this scoping period, WAPA received 19 submissions. Comments were submitted verbally and by email, mail, and telephone. Submissions were received from two landowners or other stakeholders, three state agencies (SDDANR, SDGFP, and the South Dakota SHPO), and four federal agencies (U.S. Department of Transportation, BLM, Bureau of Indian Affairs, and EPA), which included 74 total comments. Comment topics included air quality and GHGs, wildlife and special-status species, vegetation, socioeconomics and environmental justice, noise, cultural resources and Native American concerns, water resources, hazardous materials and solid waste, public health and safety, the public involvement process, transportation and access, and the NEPA process. In total, 61 of the comments resulted in responses that are included in Appendix J, which have also been addressed in this draft EA. The remaining 13 comments either provided factual information or statements of support or opposition that did not require a response.

Comments received during the public scoping period were considered while identifying issues and evaluating impacts in this EA. A summary of substantive public comments received during the scoping period and on the draft EA, as well as responses, is provided in Appendix J.

5.1 LIST OF FEDERAL AGENCIES

The following federal agencies were contacted for the purpose of the EA scoping process:

- Advisory Council on Historic Preservation
- Federal Emergency Management Agency, Regional VIII
- Federal Energy Regulatory Commission, Office of Energy Projects
- Federal Highway Administration, South Dakota Division
- USACE, South Dakota Regulatory Office
- U.S. Department of the Interior, Bureau of Indian Affairs, Great Plains Regional Office
- U.S. Department of the Interior, BLM, South Dakota Regional Office
- EPA Region 8
- USDA Rural Utilities Service, Water and Environmental Program
- USDA NRCS, South Dakota State Office
- USDA South Dakota State Farm Service Agency
- USGS, Midwest Region

- U.S. Department of Transportation, FAA, Great Lakes Region
- USFWS
- USFWS South Dakota Field Office
- U.S. House of Representatives
- U.S. Senate

5.2 STATE AND LOCAL AGENCIES

The following state and local agencies were contacted for the purpose of the EA scoping process:

- Governor's Office of Economic Development
- Haakon County Conservation District
- Haakon County Historical Society
- SDDANR
- SDDANR Division of Agriculture and Environmental Services
- South Dakota Department of Transportation
- South Dakota Department of Tribal Relations
- SDGFP
- South Dakota House of Representatives, District 27
- South Dakota Office of the Governor
- SDPUC
- South Dakota School and Public Lands
- South Dakota Senate, District 27
- South Dakota SHPO

5.3 NATIVE AMERICAN TRIBES

Pursuant to Section 106 of the NHPA, WAPA initiated Tribal consultations with the following 10 Tribes, by letter on December 7, 2022, regarding the Project:

- Apache Tribe of Oklahoma
- Cheyenne and Arapaho Tribes, Oklahoma
- Cheyenne River Sioux Tribe
- Crow Creek Sioux Tribe
- Fort Belknap Indian Community
- Lower Brule Sioux Tribe
- Oglala Sioux Tribe
- Rosebud Sioux Tribe

- Santee Sioux Nation
- Standing Rock Sioux Tribe

The Standing Rock, Sioux, the Northern Cheyenne, the Cheyenne and Arapaho and Cheyenne River Tribes all will participate in consultation. No responses were received from the other Tribes invited.

5.4 NON-GOVERNMENTAL ORGANIZATIONS

The following non-governmental organizations were contacted to participate in the EA scoping process:

- Midland Historical Society
- West River Historical Society

No response to the invitation to participate was received from these organizations.

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6 LIST OF PREPARERS

Table 6-1 identifies the personnel responsible for the preparation of this EA.

Table 6-1. List of Environmental Assessment Preparers

Name	Position	Role
John Russell	WAPA Environmental Manager	NEPA coordinator
Staffan Peterson	WAPA Archaeologist	Cultural specialist and Tribal liaison
Brian Pauly	WAPA Biologist	Lead biologist
Martin Piorkowski	WEST Consulting Ecologist	Project management
Matt Zoss	SWCA Project Manager, NEPA Specialist	Project management, NEPA oversight
Victoria Edwards	SWCA Assistant Project Manager, NEPA Specialist	Project management, land use and public facilities, noise
David Fetter	SWCA Senior NEPA Lead	Senior NEPA oversight
Sarah Lupis	SWCA NEPA Specialist	Public involvement specialist
Matt Hull	SWCA Cultural Resources Specialist	Cultural resources
Andrea Hannan	SWCA Biologist	Wildlife, threatened, endangered and special-status species, hydrologic setting and water resources
Andrew Gerwitz	SWCA Paleontologist	Geology, soil resources, and paleontology
Annie Ng	SWCA NEPA Specialist	Environmental justice, socioeconomics, air quality
Mallory Phillips	SWCA NEPA Specialist	Visual resources
Trevor Herritt	SWCA NEPA Specialist	Vegetation, health and safety
Seth Gately	SWCA Air Quality Specialist	Air quality oversight

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