Application for a Certificate of Site Compatibility for the Ashley Wind Energy Project in McIntosh County, North Dakota Case No. PU-09-370

Prepared for:
North Dakota Public Service Commission
600 E. Boulevard, Dept. 408
Bismarck, North Dakota 58505

Submitted by:
CPV Ashley Renewable Energy Company, LLC
50 Braintree Hill Office Park, Suite 300
Braintree, Massachusetts 02184

Prepared by:
Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, Massachusetts 02110

Fredrikson & Byron, P.A.
200 North 3rd Street, Suite 150
Bismarck, North Dakota 58501

May 2010

TABLE OF CONTENTS

TABLE OF CONTENTS – *Cont'd*

TABLE OF CONTENTS – *Cont'd*

TABLE OF CONTENTS – *Cont'd*

TABLES

TABLE OF CONTENTS – *Cont'd*

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

AADT	Average Annual Daily Traffic
Act	North Dakota Energy Conversion and Transmission Facility Siting Act
AM	amplitude modulation
AMP	Adaptive Management Plan
APE	area of potential effect
ARPA	Archeological Resources Protection Act
ASTM	American Society for Testing and Materials
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BMPs	best management practices
Certificate or CSC	Certificate of Site Compatibility
CFR	Code of Federal Regulations
CPV	CPV Ashley Renewable Energy Company, LLC
CPVH	Competitive Power Ventures, Holdings, LLC
CPV REC	CPV Renewable Energy Company, LLC
CRP	Conservation Reserve Program
CWA	Clean Water Act
DOE	Department of Energy
EA	Environmental Assessment
easement agreement	Wind Energy Project Easement Agreement
EDR	Environmental Data Resources, Inc.
EMF	electromagnetic fields
EPC	engineering, procurement, and construction
ESA	Environmental Site Assessment or Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FERC	Federal Energy Regulatory Commission
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FLP	Farm Loan Program
FM	frequency modulation
FSA	Farm Service Agency
ft	feet/foot
GE	General Electric
GIS	geographic information system
gpm	gallons per minute
Hz	Hertz
ISO	Organization for International Standardization
KEM	KEM Electric Cooperative, Inc.
kV	kilovolt
LMR	Land Mobile Radio
LOI	Letter of Intent
m	meter

ACRONYMS AND ABBREVIATIONS – *Cont'd*

m/s	meters per second
MDU	Montana-Dakota Utilities Co.
met tower	meteorological tower
mi	mile
mi^2	square mile
min	minute
MISO	Midwest Independent Transmission System Operator
MW	megawatt
MWh	megawatt hours
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDCRS	North Dakota Cultural Resource Survey
NDDOH	North Dakota Department of Health
NDDOT	North Dakota Department of Transportation
NDIC	North Dakota Industrial Commission
NDGFD	North Dakota Game and Fish Department
NDNHI	North Dakota Natural Heritage Inventory
NDPRD	North Dakota Parks and Recreation Department
NDSWC	North Dakota State Water Commission
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NHPA	National Historic Preservation Act
NLCD	National Land Cover Dataset
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive area
NWI	National Wetlands Inventory
NWP	Nationwide Permit
OEM	original equipment manufacturer
OHWM	Ordinary High Water Mark
O&M	operation and maintenance
Operator	Entity hired to operate the constructed Project
PLOTS	Private Lands Open to Sportsmen
PPA	Power Purchase Agreement
Project	Ashley Wind Energy Project
PSC or the Commission	Public Service Commission
PTC	production tax credit
Q1	First quarter of the fiscal year
Q2	Second quarter of the fiscal year

ACRONYMS AND ABBREVIATIONS – *Cont'd*

Q3	Third quarter of the fiscal year
Q4	Fourth quarter of the fiscal year
REC	recognized environmental condition
REPP	Renewable Energy Policy Project
road agreement	Road Use and Maintenance Agreement
rpm	rotations per minute
RPW	relatively permanent water
RSA	rotor swept area
SCADA	Supervisory Control and Data Acquisition
SHPO	State Historic Preservation Office
Siemens	Siemens Energy, Inc.
SPCC Plan	Spill Prevention Control and Countermeasure Plan
Survey	Class I cultural resources survey
SWPPP	Storm Water Pollution Prevention Plan
Tetra Tech	Tetra Tech EC, Inc.
TNW	traditional navigable water
TVA	Tennessee Valley Authority
UND	University of North Dakota
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WCFZ	Worst Case Fresnel Zone
WMA	Wildlife Management Area
WPA	Waterfowl Production Area
WRP	Wetland Reserve Program
WRRS	Wildlife Response and Reporting System

1. INTRODUCTION

CPV Ashley Renewable Energy Company, LLC (CPV), a direct wholly-owned subsidiary of CPV Renewable Energy Company, LLC (CPV REC), respectfully submits this application to the North Dakota Public Service Commission (PSC or the Commission) for a Certificate of Site Compatibility (Certificate or CSC) for construction of the Ashley Wind Energy Project (the Project). CPV initially submitted a Letter of Intent (LOI) to file this application to the PSC on June 19, 2009. An updated LOI was submitted on November 18, 2009. The proposed Project will be located in McIntosh County, North Dakota, and will provide a total of up to approximately 200.1 megawatts (MW) of renewable wind energy.

CPV REC is a wholly-owned subsidiary of Competitive Power Ventures Holdings, LLC (CPVH). CPVH is dedicated to increasing America's sustainability, both economically and environmentally, by using domestically available energy sources, like wind and natural gas (Appendix A). CPVH's corporate mission is built around a belief that progressive companies can be powerful agents of change for a better world and a cleaner environment. To this end, CPVH has focused its core activities around developing and operating energy facilities that can make a significant difference in improving the environment and economic well-being of the community that they serve.

The companies are headquartered in Silver Spring, Maryland, with offices in Braintree, Massachusetts, San Francisco, California and Toronto, Canada. CPVH, through its subsidiaries, currently has 4,500 MW of clean, natural gas generation projects in various stages of development across North America, 4,300 MW of natural gas generation under management and is currently expanding its expertise into ethanol plant management. CPV REC is currently developing over 8,000 MW of wind power and photovoltaic projects across North America. A 101.2-MW wind project developed by their subsidiary CPV Keenan Renewable Energy was constructed in 2009 and is now operational in Woodward County, Oklahoma as the OU Spirit Wind Farm. CPV REC has a 151.8-MW wind farm, CPV Keenan II Renewable Energy Company, LLC, that is currently under construction and will be on-line by the end of 2010.

1.1 Compliance with the Energy Conversion and Transmission Facility Siting Act Chapter 49-22

Under the North Dakota Energy Conversion and Transmission Facility Siting Act (the Act) (North Dakota Century Code [NDCC] 49-22), a proposed energy conversion facility requires a Certificate from the PSC in order to be located, constructed, and operated in the State of North Dakota. The Act specifies that the siting of an energy conversion facility is to be made "in an orderly manner compatible with environmental preservation and the efficient use of resources" (NDCC 49-22-02).

CPV has considered exclusion and avoidance areas and selection and policy criteria set forth in Section 69-06-08-01 of the North Dakota Administrative Code (NDAC) in the design of the Project. To the extent applicable, these key factors and criteria are discussed in this application. In addition, to facilitate thorough evaluation of the proposed site, Project design and technical information have also been provided. Table 1-1 outlines the information required to fulfill the requirements for an application for a Certificate from the PSC and where these requirements are addressed in this application.

Table 1-1. Certificate Completion Checklist

State Authority	Description	Section
NDCC 49-22-08	PSC Guidelines: Energy Conversion and Transmission Facility Siting (November 1979)	
Section A	Description	
1.	Type: Describe the type of energy conversion facility proposed and provide a diagram of the major process system or a flow diagram.	1.2, 4.1; Figures 6 and 7
2.	Product: Describe in general terms and technical terms the products to be produced by the proposed facility.	1.2.3, 6.1, 6.3; Figure 5
3.	Size and Design: Provide the following description of the production capacity and design:	1.2.1, 1.2.3, 5.1; Appendix B
a.	Gross design capacity;	1.2.3
b.	Net design capacity;	1.2.3
c.	Estimated thermal efficiency of the energy conversion process and the assumptions upon which the estimate is based;	N/A
d.	The number of acres that the proposed facility will occupy; and	1.2.1, 5.1
e.	One (1) copy of all design data reports separate from the application.	Appendix B
4.	Time Schedule: Provide the anticipated time schedule for the accomplishment of the following:	1.3
a.	Certificate of Site Compatibility;	1.3
b.	Land acquisition complete;	1.3
c.	Construction start date;	1.3
d.	Construction complete;	1.3
e.	Test operations;	1.3
f.	Commercial production date;	1.3
g.	100 percent capacity factor; and	1.3
h.	Any expansion or additions.	1.3
Section B	Studies	
	Provide a copy of any evaluative studies or assessments of the environmental impact of the proposed facility submitted to any federal, regional, state, or local agency	Appendix C
Section C	Need for Facility	
1.	An analysis of the need for the proposed facility based on present and projected demand for the product or products to be produced by the proposed facility, including the most recent system studies supporting the analysis of the need.	2.1
2.	A description of any feasible alternative methods of serving the need.	2.2
3.	A statement justifying any deviations from the most recent Ten-Year Plan which the proposed facility may present.	2.3
Section D	Location	
1.	Select a study area, which includes the proposed facility site, of sufficient size to enable the Commission to evaluate the factors addressed in Section 49-22-09, NDCC.	1.2.1, 5.1, 10; Figures 1-3
2.	Discuss the utility's policies and commitments to limit the environmental impact of its facilities, including copies of board resolutions and management directives.	Appendix A
3.	Identify and map the criteria that led to the proposed facility location within the study area.	1.2, 3; Figures 4 and 10

State Authority	Description	Section
4.	Discuss in detail the relative value of each criteria and how the proposed facility location was selected giving consideration to all criteria.	3
5.	The criteria to be evaluated shall include at a minimum all of the following which are within the study area:	3
a.	Exclusion areas;	3.1; Figure 4
b.	Avoidance areas;	3.2; Figure 4
c.	Selection criteria;	3.3
d.	Policy criteria;	3.4
e.	Design and construction limitations; and	3.5
f.	Economic considerations.	3.6
6.	Discuss the mitigative measures that will be taken to minimize adverse impacts which result from the location, construction, and operation of the proposed facility.	7.2.3, 7.3.3, 7.4.3, 7.5.3, 7.6.3, 7.7.3, 7.8.3, 7.9.3, 7.10.3, 7.11.3, 7.12.3, 7.13.3, 7.14.3, 7.15.3, 7.16.3, 7.17.3
7.	List the qualifications of the people in the various disciplines that contributed to the facility site location study.	11
8.	Maps	Figures
a.	Map the criteria within the study area showing the proposed facility location. Several different criteria may be shown on each map, depending on the map scale and the density and nature of the criteria. Minimum map scale shall be ½ inch = 1 mile. All maps shall be at the same scale unless otherwise specified.	Figures 1-4, 7-10, 12-15
b.	Furnish one Mylar map, separate from the application, of the same scale as the criteria maps and showing the same basic features as the criteria maps, including the study area, but not the proposed facility location.	Not included. PSC supports not providing a Mylar map, requirement is outdated.
NDCC 49-22-09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	
1.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	10.1
2.	The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.	10.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility.	10.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	10.4
5.	Alternatives to the proposed site, corridor or route which are developed during the hearing process and which minimize adverse effects.	10.5
6.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	10.6
7.	The direct and indirect economic impacts of the proposed facility.	10.7
8.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.	10.8
9.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	10.9
10.	The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species.	10.10
11.	Problems raised by federal agencies, other state agencies, and local entities.	10.11

1.2 Project Summary

The proposed Project will be located in McIntosh County, North Dakota, approximately 6 miles (mi) north of the City of Ashley (Figure 1) and will consist of up to approximately 200.1 MW of renewable wind energy capacity. The Project Area is defined as approximately 17,400 acres of private land subject to a Wind Energy Project Easement Agreement (easement agreement) between landowners and CPV for the construction and operation of the Project (Figures 2 and 3). Of the 17,400 acres, only approximately 0.4 percent is expected to be permanently affected by the Project. Project facilities will likely include:

- wind turbines, described in detail in Section 6.2;
- new gravel access roads and improvements to existing roads;
- underground electrical collection lines;
- an operation and maintenance (O&M) building;
- interconnection substation facility;
- up to four 80 to 90 m tall permanent meteorological towers (met towers); and
- a temporary batch plant area and staging/laydown area for the construction phase of the Project.

The Project will interconnect to the Midwest Independent Transmission System Operator (MISO) electric grid via a 230-kilovolt (kV) Montana-Dakota Utilities Co. (MDU) transmission line that passes through the Project Area.

CPV selected the general Project vicinity as a potential site for development of a wind energy conversion facility on the basis of its energetic wind resources and accessibility to the existing electrical grid. CPV subsequently began interacting with the Project community in order to gauge the receptiveness of local landowners and authorities to wind energy development. CPV has been actively engaged in the community since December 2007, including interactions with private landowners and local agencies and authorities. Overall reception by the local community has been positive, and CPV has obtained easement agreements with over 70 landowners totaling over 37,000 acres of private land under control in McIntosh County. The scope of this application is limited to the up to approximately 200.1 MW of generation and associated 17,400-acre Project Area. The proposed Project and supporting facilities will be sited, constructed, and operated entirely within the 17,400-acre Project Area. In selecting the proposed Project Area, CPV considered the exclusion and avoidance criteria outlined in NDAC 69-06-08-01 (Figure 4).

1.2.1 Proposed Area

The Project Area comprises numerous parcels of private land subject to easement agreements between CPV and landowners. The Project Area was selected to include all areas necessary to optimize the wind resource while avoiding and minimizing impact on environmental resources. Table 1-2 presents the townships, sections, and ranges within McIntosh County containing the Project Area.

Table 1-2. Project Area Location

Township	Range	Sections
T131N	R69W	5-11, 14-23, 26-30
T131N	R70W	1, 2, 11-14, 23, 24
T132N	R69W	31, 32
T132N	R70W	35, 36

The Project Area boundary line includes approximately 17,400 acres (27 square miles [mi^2]) of land. As shown in Figures 1 through 3, there are a few parcels of land within the larger Project Area boundary line that are not subject to easement agreements; however, no Project facilities will be constructed on these excluded parcels. Turbines and ancillary facilities will be placed throughout the leased portion of the Project Area; however, the total permanent footprint of the Project will only occupy approximately 0.4 percent of the total Project Area.

1.2.2 Project Layout

For this application, CPV has developed a Project layout within the Project Area. An updated Project layout map will be provided to the PSC for review prior to the CSC hearing. Within the permitted Project Area, CPV will configure Project turbines in a design that optimizes electrical generation and efficiency based on the existing wind resource. CPV will arrange the Project turbines and ancillary facilities within the approved Project Area subject to required and voluntary setbacks from environmentally sensitive areas, roads, occupied residences, or other restricted areas defined in the easement agreements, Certificate conditions, and other applicable local, state, or federal permit conditions.

Once the PSC issues the Certificate, CPV will complete any additional studies required by the Certificate, CPV's internal siting process, and any additional studies required by all other permits and regulatory agencies related to the Project. CPV will also further evaluate the Project Area based on engineering considerations, efficient construction of the Project, and additional input from landowners on micrositing of wind turbines and associated facilities on their property. Following completion of these additional studies and communications, microsited locations of Project components will be re-evaluated to confirm their conformance with the Certificate conditions and other constraints and setback requirements. Prior to construction, a final site plan for the Project will be submitted to the PSC and a pre-construction meeting will be held with PSC staff to ensure that the site plan conforms to the Certificate requirements. Following completion of construction, as-built site plans will be furnished for PSC's Project files.

1.2.3 Projected Output

The Project will have a nameplate (gross) capacity of up to approximately 200.1 MW, with projected average annual output up to 840,000 megawatt hours (MWh) per year (assuming net capacity factors of between 40 and 48 percent). As with all wind projects, the actual Project output will be determined by wind resource, final design, site-specific features, and equipment.

1.3 Project Schedule

The commercial operation date of the Project is planned for the fourth quarter of the fiscal year (Q4) 2012. This date is dependent upon permitting, equipment deliveries, and other Project activities. Project construction may start as early as Q2 2011 or as late as Q2 2012. A major milestone schedule for the Project is presented below:

1. Land Control: Complete
2. Environmental Studies: Complete
    a. Critical issues analysis
    b. Constraints mapping
    c. Native prairie survey
    d. Whooping crane likelihood of occurrence analysis
    e. Bat likelihood of occurrence analysis
    f. Fall 2009 avian point count survey
    g. Class I cultural resources investigation
    h. Microwave beam path interference study
    i. Aviation feasibility evaluation
3. Environmental Studies: Currently on-going/scheduled to be complete mid-2010
    a. Spring avian point count survey
    b. Wetland delineations
    c. Acoustic modeling
    d. Shadow flicker analysis
    e. Class III archeological investigation
4. Certificate of Site Compatibility: Late 2010
5. Permits: End of 2010
6. Interconnection Agreement: First half of 2011
7. Equipment Procurement, Manufacture and Delivery: 2011-2012
8. Construction: As early as early 2011
9. Test and Operations: Late 2012
10. Commercial Operation: Late 2012

1.4 Project Ownership

CPV plans to own and operate the Project as well as manage the construction of all equipment and associated facilities related to the Project. CPV will procure the turbine and tower package directly from an original equipment manufacturer, while a third-party contractor will perform all other activities associated with engineering, procurement, and construction (EPC) of the Project.

2. NEED FOR FACILITY

2.1 Need Analysis

The proposed Project is intended to satisfy the needs of both the State of North Dakota, which has committed to becoming a leading supplier of renewable energy to the nation, and the Tennessee Valley Authority (TVA), which is purchasing up to 200 MW of the Project's new wind energy generation output.

The Project is consistent with North Dakota's commitment to increasing the renewable energy portfolio of both the state and the nation. North Dakota has the greatest potential wind energy capacity of any state in the nation, and is theoretically capable of powering over a fourth of all United States (U.S.) electricity demand from this resource (AWEA 2009). The leaders of North Dakota have recognized the significance and value of the potential of the state's wind and other renewable resources, and have demonstrated a commitment towards fulfilling it. In his 2007 State of the State Address, North Dakota Governor John Hoeven stated:

> "…we have only begun to tap the true potential for our state's varied energy and energy-related agricultural industries. To realize our full potential, we must look beyond the borders of our state. Our real future in energy is not about what we consume in North Dakota – it's about what we can supply to the nation, a nation that needs more energy and more energy independence…By leveraging our enormous potential for both renewable and traditional energy resources, we can truly make North Dakota a powerhouse for America." (Hoeven 2007)

North Dakota's emphasis on renewable energy began internally, with the enactment of the State Renewable and Recycled Energy Objective (NDCC 49-02-28), which established a goal of producing 10 percent of all of its electricity through renewable and recycled energy by 2015. As North Dakota has progressed towards this statewide objective, it has expanded its policies to also focus on supporting the growing renewable energy portfolio of the entire U.S. This emphasis was formalized through the adoption of the "25x'25 Initiative" of the Midwestern Governor's Association in House Bill No. 1462 by the 2007 North Dakota Legislative Assembly. The "25x'25 Initiative" is set forth in NDCC 17-01-01 and states that the goal, in part, is for not less than 25 percent of the total energy consumed in the U.S. to be provided from renewable resources. By adopting this initiative, North Dakota has signaled its recognition of a need for greater renewable energy generation throughout the U.S., and a desire to contribute to fulfilling that need.

TVA is an agency and instrumentality of the U.S., established by an act of Congress in 1933, to foster the social and economic welfare of the people of the Tennessee Valley region and to promote the proper use and conservation of the region's natural resources. One component of this mission is the generation, transmission, and sale of reliable and affordable electric energy. TVA operates the nation's largest public power system, producing 4 percent of all electricity in the nation. TVA provides electricity to most of Tennessee and parts of Virginia, North Carolina, Georgia, Alabama, Mississippi, and Kentucky. It serves about 9 million people in this seven-state region through 157

power distributors and 58 directly served large industries and federal facilities. The TVA Act requires the TVA power system to be self-supporting and operated on a nonprofit basis, and the TVA Act directs TVA to sell power at rates as low as are feasible.

TVA's Strategic Plan includes the objective to reduce its environmental footprint through demand reduction and by increasing clean energy resources in its generation mix. The TVA Board of Directors recently authorized the purchase of as much as 2,000 MW of renewable and clean energy by 2011 as part of TVA's plan to have half of its power supply from clean and renewable energy sources by 2020. Accomplishing this goal will require increasing the availability of clean generation such as wind power to TVA. Achieving these goals will also assist TVA in meeting potential renewable portfolio standards, broadening its generation mix, sustaining grid reliability, and meeting future consumer demand for electricity through low or no carbon-emitting facilities.

The construction and operation of the proposed Project will specifically contribute towards TVA's objectives by creating a profitable, economically viable wind-powered energy facility that will provide a significant source of clean, reliable, renewable energy to TVA customers. Based on the on-site meteorological data collected to date and long-term projections, the Project Area offers an optimal opportunity for a cost-effective, economically viable wind energy generation facility that will add a significant commercial-scale renewable energy generation source to the existing grid and TVA's renewable energy portfolio.

The Project will satisfy the state of North Dakota's goal of expanding the clean renewable energy portfolio of the entire U.S. and help TVA satisfy its commitments to environmental stewardship, providing affordable energy, and supporting regional economic growth.

2.2 Alternatives

Based on the stated need for the Project, reasonable alternatives to the proposed Project include other renewable energy sources, such as solar, geothermal, hydropower, and biomass. However, none of these renewable energy sources are economically viable alternatives for producing up to 200.1 MW of electricity within the Project Area. Also, in comparison to wind energy, biomass and solar would incur vastly greater environmental impact on the Project Area. The Project Area does not currently produce sufficient biomass to fuel a large-scale biomass plant, and the environmental impacts of converting large tracts of existing cropland and grassland to biomass production could be considerably greater than those of the proposed Project. Likewise, a commercial-scale solar project would require the use of thousands of contiguous acres of land, which would have far greater impact on landowners and the environment than will the proposed Project. Consequently, the proposed Project is the preferred alternative over other alternative renewable energy sources.

2.3 Ten-Year Plan

As required, CPV is filing a Ten-Year Plan with the PSC and the McIntosh County auditor concurrently with this application. A copy of the Ten-Year Plan is provided in Appendix G.

3. SITE SELECTION CRITERIA

As noted in Section 1.2, CPV selected the proposed Project Area on the basis of a number of factors, including its energetic wind resources, its accessibility to the existing electrical grid, the receptiveness of the local community to wind energy development, and numerous environmental factors and economic considerations. This decision was informed by various desktop and field environmental studies, informal interactions with state agencies, local agencies, and local landowners, meteorological data collection, and other studies conducted by CPV. Although CPV has identified the proposed Project Area as favorable for wind energy development, CPV continues to evaluate it in order to identify the optimal Project layout. This process of site selection will be conducted in conformance with the Act, which specifies that an energy conversion facility must be sited "in an orderly manner compatible with environmental preservation and the efficient use of resources" (NDCC 49-22-02). Detailed guidance for this siting process is provided by the energy conversion facility siting criteria described in NDAC 69-06-08-01, which identifies "exclusion areas," "avoidance areas," "selection criteria," and "policy criteria." The following sections detail the conformance of the Project's site selection with these criteria, as well as other factors critical to site selection, including design and construction limitations and economic considerations.

3.1 Exclusion Areas

In accordance with NDAC 69-06-08-01(1), each geographical area listed in Table 3-1 "shall be excluded in the consideration of a site for an energy conversion facility, and shall include a buffer zone of a reasonable width to protect the integrity of the area." Exclusion areas are mapped for the Project Area on Figure 4.

Table 3-1. Exclusion Areas

Exclusion Area	Present within Project Area?	Description and Proposed Buffer	Section Addressed
Designated or registered national: parks; memorial parks; historic sites and landmarks; natural landmarks; historic districts; monuments; wilderness areas; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.	Yes	Waterfowl Production Areas (WPA) are present within the Project Area boundary but none are on land subject to easement agreement between CPV and landowners. The Project turbines, substation, and O&M building will not be placed within 0.25 mi of WPAs.	7.8, 7.9, 7.15, 7.16, 7.17 Figures 4, 8, 10
Designated or registered state: parks; forests; forest management lands; historic sites; monuments; historical markers; archaeological sites; grasslands; wild, scenic, or recreational rivers; game refuges; game management areas; management areas; and nature preserves.	Yes	One presently recorded archeological site is known within the Project Area; no buffer is required to protect the integrity of site.	7.8, 7.9, 7.15, 7.16, 7.17 Figures 4, 8, 10
County parks and recreational areas; municipal parks; parks owned or administered by other governmental subdivisions; hardwood draws; and enrolled woodlands.	No		7.3, 7.9, 7.10

Exclusion Area	Present within Project Area?	Description and Proposed Buffer	Section Addressed
Prime farmland and unique farmland, as defined by the land inventory and monitoring division of the soil conservation service, United States Department of Agriculture (USDA), in 7 C.F.R. Part 657; provided, however, that if the Commission finds that the prime farmland and unique farmland that will be removed from use for the life of the facility is of such small acreage as to be of negligible impact on agricultural productions, such exclusion shall not apply.	Yes	Prime farmland and Farmland of Statewide Importance is present within the Project Area, however the acreage to be removed from use for the life of the Project will have a negligible impact on agricultural productions (0 acre of prime farmland affected; 0.4 acre of Farmland of Statewide Importance affected).Therefore, CPV requests that the Commission determine that a prime farmland exclusion shall not apply to the Project.	7.10, 7.11 Figures 4 and 13 Table 7-3
Irrigated land.	No		7.3.2
Areas critical to the life stages of threatened or endangered animal or plant species.	No	Piping Plover Critical Habitat is present near but not within the Project Area; no Project facilities will be placed within 0.5 mi of said habitat.	7.17 Figure 4
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged.	No		7.14, 7.15, 7.16, 7.17

3.2 Avoidance Areas

In accordance with NDAC 69-06-08-01(2), the geographical areas listed in Table 3-2 "shall not be approved as a site for an energy conversion facility unless the applicant shows that under the circumstances there is no reasonable alternative." As with exclusion areas, avoidance areas shall include buffer zones of reasonable widths to protect the integrity of the areas. In determining whether an avoidance area should be designated for a facility, the PSC may consider, among other things: the proposed management of adverse impacts; the orderly siting of facilities; system reliability and integrity; the efficient use of resources; and alternative sites. Avoidance areas are also mapped for the Project Area on Figure 4.

Table 3-2. Avoidance Areas

Avoidance Areas	Present within Project Area?	Description and Proposed Buffer	Section Addressed
Historical resources which are not designated as exclusion areas.	Yes	Although not designated presently as recorded archeological sites, CPV will avoid cemeteries and mapped historic structures. No buffers are required to protect the integrity of these areas.	7.8 Figure 4
Areas within the city limits of a city or the boundaries of a military installation.	No		7.3 Figures 1-3
Areas within known floodplains as defined by the geographical boundaries of the hundred-year flood.	No	Floodplains have not been mapped by the Federal Emergency Management Agency (FEMA) in the Project Area. The State Water Commission acknowledged in a letter dated February 17, 2010 that the Project Area is not located in an identified floodplain and believes the Project will not affect an identified floodplain.	7.13, 10.11.10

Avoidance Areas	Present within Project Area?	Description and Proposed Buffer	Section Addressed
Areas that are geologically unstable.	No	United States Geological Survey (USGS) reports classify seismic activity in McIntosh County as being very low.	7.12
Woodlands and wetlands.	Yes	Wetland resources will be avoided to the extent practicable. Woodland impacts are not anticipated. No buffers are required to protect the integrity of these areas.	7.3, 7.10, 7.13, 7.14 Figures 4, 12 and 15
Areas of recreational significance which are not designated as exclusion areas.	No		7.9

3.3 Selection Criteria

In accordance with NDAC 69-06-08-01(3), "[a] site shall be approved in an area only when it is demonstrated to the commission by the applicant that any significant adverse effects resulting from the location, construction, and operation of the facility in that area, as they relate to [the selection criteria listed in Table 3-3], will be at an acceptable minimum, or that those effects will be managed and maintained at an acceptable minimum."

Table 3-3. Selection Criteria

Selection Criteria	Potential Adverse Effects	Section Addressed
The impact upon agriculture:		
Agricultural production.	The Project will not result in a significant loss of agricultural production. Only 40% of the Project Area is agricultural lands (crop and hay); based on the layout, approximately 28 acres of agricultural land will be permanently impacted by Project operation.	7.3, 7.10
Family farms and ranches.	No turbines will be placed within 1,400 feet (ft) of occupied residences, which will greatly reduce potential adverse effects to local family farms and ranches. Landowners party to easement agreements with CPV for construction of the Project will receive a supplemental income that will offset farming and ranching losses due to Project facilities on their land.	7.2, 7.3, 7.10, Figure 10
Land which the owner demonstrates has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation.	Landowners party to easement agreements with CPV have not expressed concerns related to irrigation on their property. Currently, no known irrigation is present in the Project Area.	7.10, 7.11 Figures 13 and 14
Surface drainage patterns and ground water flow patterns.	No adverse impacts on surface drainage patterns or groundwater flow patterns are anticipated.	7.11, 7.12, 7.13, 7.14 Figure 15
The agricultural quality of the cropland.	No adverse impacts on the agricultural quality of the cropland are anticipated. Should soil compaction or other agricultural concerns occur on cropland during construction, CPV and the landowners will work to remedy the situation.	7.10, 7.11

Selection Criteria	Potential Adverse Effects	Section Addressed
The impact upon the availability and adequacy of:		
Law enforcement.	No adverse impacts are anticipated.	7.4
School systems and education programs.	No adverse impacts are anticipated.	7.4
Governmental services and facilities.	No adverse impacts are anticipated.	7.4
General and mental health care facilities.	No adverse impacts are anticipated.	7.4
Recreational programs and facilities.	No adverse impacts are anticipated.	7.4, 7.9
Transportation facilities and networks.	During construction, the Project Area will see a temporary increase in vehicle use of the existing public transportation facilities and networks. However, during operation no adverse impacts on the availability and adequacy of these resources are anticipated. CPV has entered into a Road Use and Maintenance Agreement (road agreement) with McIntosh County that will ensure that, following the completion of construction, roads are returned to as good or better condition than they were in pre-construction.	7.4 Figure 9
Retail service facilities.	No adverse impacts on the availability and adequacy of existing retail service facilities are anticipated; due to the influx of personnel during construction, local retailers will likely see a positive impact from the Project.	7.2
Utility services.	No adverse impacts on the availability and adequacy of existing utility services are anticipated. The Project will complete an interconnection process with MISO, MDU and any other affected utilities to ensure the continuity of utility services and to interconnect the Project in accordance with the Federal Energy Regulatory Commission (FERC), North American Electric Reliability Corporation (NERC), MISO, and MDU standards.	2.0, 6.0, 7.4
The impact upon:		
Local institutions.	No adverse impacts on existing local institutions are anticipated.	7.4
Noise-sensitive land uses.	No adverse impacts on existing noise-sensitive land uses are anticipated. The majority of noise-sensitive receptors are occupied residences of landowners party to easement agreements with CPV and turbines will be setback at least 1,400 ft from these occupied residences. McIntosh County does not have zoning or noise standards for wind turbines.	7.7
Rural residences and businesses.	No adverse impacts on existing rural residences and businesses are anticipated. Turbines will be setback at least 1,400 ft from occupied residences.	7.2, 7.3, 7.10, Figure 10
Aquifers.	No adverse impacts on aquifers are anticipated.	7.12
Human health and safety.	No adverse impacts on human health and safety to the community at large are anticipated; however, potential concerns resulting from any large construction project include construction safety, transportation safety, and safe O&M procedures.	6.5, 7.5

Selection Criteria	Potential Adverse Effects	Section Addressed
Animal health and safety.	No adverse impacts on domestic animals including livestock are anticipated. With regard to wild animal species, there exists the potential for adverse effects (displacement, injury, or mortality) to animals, but the effects are not anticipated to be at a significant level for federal or state-listed species. Working with the United States Fish and Wildlife Service (USFWS) and TVA, CPV will implement a post-construction monitoring plan in order to monitor animal health and safety issues with the Project. Monitoring efforts may include the implementation of a Wildlife Response and Reporting System (WRRS) and Adaptive Management Plan (AMP) developed with the USFWS and TVA.	7.10, 7.16, 7.17, Appendix C
Plant life.	The Project as proposed will permanently convert approximately 73 acres of vegetative cover for the turbines and ancillary facilities. No adverse impacts on federal or state-listed plant species are anticipated.	7.15 Figure 12
Temporary and permanent housing.	The Project may utilize temporary housing during construction. During operation, there is unlikely to be an adverse effect on temporary and permanent housing due to the small number of O&M employees required. It is likely that O&M employees will live near the Project and create a positive effect on the housing market by renting or purchasing then-available housing.	7.2
Temporary and permanent skilled and unskilled labor.	No adverse effects to temporary and permanent skilled and unskilled labor are anticipated. Project construction and operations should yield a benefit to the labor community, both short- and long-term.	7.2
Cumulative Impact		
The cumulative effects of the location of the facility in relation to existing and planned facilities and other industrial development.	No adverse cumulative effects due to the location of the Project in relation to existing or planned facilities and other industrial development are anticipated.	7.3

3.4 Policy Criteria

In accordance with NDAC 69-06-08-01(4), the PSC "may give preference to an applicant that will maximize benefits that result from the adoption of the following policies and practices and in a proper case may require the adoption of such policies and practices." These policy criteria are presented in Table 3-4.

Table 3-4. Policy Criteria

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
Recycling of the conversion byproducts and effluents.	Not applicable.	N/A
Energy conservation through location, process, and design.	CPV has refined the Project layout to maximize the efficiency of the operations while avoiding or minimizing the environmental impacts. CPV is utilizing buried collection lines for all of the Project collection system and is minimizing the amount of these underground collection lines to the extent practicable to reduce energy line losses between the generation point and the substation.	4.2

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
Training and utilization of available labor in this state for the general and specialized skills required.	CPV has utilized North Dakota companies and personnel for local expertise during development of the Project and intends to use local labor to the extent practicable during construction and operation as well.	7.2
Use of a primary energy source or raw material located within the state.	Wind, the sole energy source/raw material required for the Project, is a plentiful and renewable energy source within North Dakota.	5.2, 5.3
Non-relocation of residents.	No residents will be re-located as a result of the Project.	7.2, 7.3, 7.10
The dedication of an area adjacent to the facility to land uses such as recreation, agriculture, or wildlife management.	The Project is compatible with existing land uses; CPV does not propose the dedication of an adjacent area to the Project for such land uses.	7.3, 7.9, 7.16, Figures 4 and 8
Economies of construction and operation.	Where feasible, CPV will utilize local contractors, materials, equipment, and personnel during construction and operation. The Project will positively impact local and state economies through tax revenues and payments to landowners.	7.2
Secondary uses of appropriate associated facilities for recreation and the enhancement of wildlife.	None are proposed; the Project will be constructed on privately owned lands that are not open to the public for recreation.	N/A
Use of citizen coordinating committees.	No citizen coordinating committee is proposed. CPV will work directly with the landowners party to easement agreements with CPV.	8.0
A commitment of a portion of the energy produced for use in this state.	The Project will interconnect with the local utility transmission line and grid. Any excess energy from the Project beyond what is delivered to TVA may be sold to local, in-state utilities.	2.1, 6.1
Labor relations.	The Project shall have an employment policy consistent with industry practices and be responsible for determining working hours, rates of compensation, and all other matters relating to labor and employment of site personnel.	6.4.1, 7.2
The coordination of facilities.	Existing facilities and facility corridors were considered in the location of the Project and its associated facilities.	3.6, 6
Monitoring of impacts.	CPV and the EPC contractor will employ best management practices (BMPs) during construction to monitor soil impacts and segregate topsoil. Storm water prevention plans will be prepared as necessary.	7.11, 7.16, 7.17

3.5 Design and Construction Limitations

In general, three predominant design and construction limitations apply to all wind farms: wind resources; capability of interconnection to the electric grid; and landowner easements.

Wind resource is essential in selecting and designing a wind farm that will serve as a reliable and productive energy conversion facility. CPV has conducted an assessment of the meteorological conditions of the proposed Project Area to ensure that the site has ample wind energy to generate revenue for the wind farm. Refer to Sections 5.2 and 5.3 for additional information regarding the wind resource within the Project Area.

Capability for interconnection to the existing electric grid is a significant factor in Project design due to the fact that development of new, extensive transmission facilities is costly from both environmental and economic perspectives. As noted, the Project location was selected due to its proximity to an existing 230-kV transmission line. The Project will interconnect directly to this transmission line, which is located within the Project Area, thereby reducing the environmental impacts of the Project and increasing its economic viability. Refer to Section 3.6 and 6.3 for more information regarding the importance of proximity to existing transmission resources.

Easements for the construction of turbine towers and transmission facilities are also critical to the Project. CPV has secured voluntary land easement agreements with landowners in order to develop the Project.

There are also several limiting factors in design and construction that are specific to the Project. These include:

- Terms of the Power Purchase Agreement (PPA) with TVA;
- Setback requirements from Piping Plover Critical Habitat, WPAs, and occupied residences;
- Avoidance of microwave beam path;
- Aviation restriction zones;
- Avoidance or mitigation of impacts on archeological sites;
- Turbine spacing requirements;
- Road agreement with McIntosh County;
- Engineering considerations such as slopes and geotechnical considerations; and
- Minimization of permanent impacts on wetlands and waterbodies.

3.6 Economic Considerations

A major economic factor in the development of the proposed Project is that the generation output is being purchased by the Tennessee Valley Authority (TVA). The construction and operation of the proposed Project will specifically contribute towards TVA's objectives by creating an economically viable wind-powered energy facility that will provide a significant source of clean, reliable, renewable energy to TVA customers, and will add a significant commercial-scale renewable energy generation source to the existing grid and TVA's renewable energy portfolio.

The Project will not be viable without the federal production tax credit (PTC), which the American Recovery and Reinvestment Act of 2009 extends to any project in operation by the end of 2012. Approval of permits will help ensure the Project is operational before the 2012 expiration of the PTC.

Two other major economic considerations involved in the selection of the Project Area were adequate wind resource and proximate transmission system capacity. As discussed above, it is important to select a site with a wind resource capable of generating energy in order to provide a reliable, productive, and economically sustainable wind energy conversion facility. Information on the wind resource at the site is discussed in Sections 5.2 and 5.3.

The presence of existing high voltage transmission lines in the Project vicinity was a significant factor in the selection of the Project Area and in initial Project design. Furthermore, having permission to interconnect into the existing transmission system is essential. If a transmission system were not present, or if connection were not permitted, the cost of interconnection would increase due to the need to construct a transmission line and large substation in order to interconnect to an existing electricity service provider.

4. GENERAL DESCRIPTION OF THE PROPOSED FACILITY

4.1 Wind Power Technology

Wind power technology relies upon the force created by the wind to drive a turbine, which in turn drives a generator. The rotor of the wind turbine turns due to the lift created as wind passes over the turbine blades. This rotational energy is then transferred to the generator via a hub, main shaft, and system of gears.

While the exact turbine manufacturer and model has not been selected for the Project, it is expected that the wind turbine generator to be used will fall between 2.3 and 2.5 MW per unit in generating capacity, 80 to 85 m in hub height, and 100 to 103 m in rotor diameter (Figure 5). Depending on the model selected, the Project could install up to 87 turbines to meet full generation capacity. Additional information on two possible wind turbines that could be used at the Project is provided in Section 6.2. The exact turbine model to be used is subject to change in order to ensure that the turbine model ultimately selected is both cost-effective and optimizes land and wind resources.

Each turbine tower will be constructed upon a dedicated concrete foundation. The design of this foundation may vary based upon local soil and other geotechnical conditions. A control panel containing communication and electronic circuitry will be housed within each turbine tower. Each turbine will be equipped with sensors for wind speed and direction, which will signal to the turbine's control system when winds are adequate for operation. To enhance aerodynamic efficiency, turbines are also equipped with variable-speed control and independent blade pitch.

In order to be distributed to the facility's power collection line system, the electricity from each turbine is raised (stepped up) to a voltage of approximately 34.5 kV by a pad-mounted transformer. The electricity is then collected by a system of underground power collection lines direct-buried on private property or public rights-of-way within the Project Area. Typically, underground electrical collection lines and communication cables are co-located adjacent and parallel to Project access roads or along public rights-of-way or easements, wherever practicable, at a depth of approximately 4 ft. Where underground collection lines are not co-located in access roads, they most often take a more direct path from the point of generation back to the substation and will also be buried at a depth of approximately 4 ft. Figure 6 depicts the general path of energy from the Project to energy users.

All-weather, permanent gravel access roads approximately 16 ft in width will connect wind turbines to the existing county and local road network. At the intersection of the access roads and public roads, the underground communication and collection lines will continue as feeder lines, distributing power to the Project substation. At the Project substation, the power will again be stepped up to 230 kV and transmitted via a 230-kV interconnection station to the existing 230-kV MDU transmission line. The Project substation and interconnection to the existing MDU line will conform to the NERC, MISO, and MDU standards as detailed in the Interconnection Agreement.

4.2 Wind Energy Project Layout

CPV will develop a Project layout that optimizes wind resource, minimizes the impact on land resources and potentially sensitive areas, and conforms to the energy conversion facility siting criteria described in NDAC 69-06-08-01.

The most important consideration in adequate and reliable generation of wind-powered electricity is the localized availability of the wind resource. The energy available from wind is directly related to wind speed; however, the relationship between wind speed and power generation is not linear. Rather, the capacity for power generation increases at the third power of the wind speed. Analysis of meteorological data collected at the Project Area suggests that turbine strings should optimally be aligned in strings running southwest to northeast. Turbines within strings are typically separated by approximately 0.25 mi, while strings are separated by approximately 0.75 to 1.25 mi. Design of the turbine array and collection system will seek to follow this general alignment, while minimizing energy loss due to wind turbine wakes and turbulence, and electrical line losses.

McIntosh County has no specific setbacks or standards for wind energy facilities. Table 4-1 identifies the minimum setbacks CPV is applying to the Project.

Table 4-1. Setback Distances Applied to the Project

Setback Type	Distance
Project Boundary*	1.1x blade tip height
Occupied Residence*	1,400 ft
Designated Piping Plover Critical Habitat	0.5 mi
Waterfowl Production Area**	1,320 ft
Center of County, State or Federal Road Right of Way*	1.1x blade tip height
Overhead Transmission and Distribution Lines*	1.1x blade tip height

* Setback is only applicable to turbines. This setback distance will not apply to O&M building, substation, roads, underground collection lines, and other near-ground activities.

** Setback is only applicable to turbines, O&M building, and substation. This setback distance will not apply to roads, underground collection lines, and other near-ground activities.

4.3 Associated Facilities

Additional standing facilities associated with the Project will include an O&M building, a Project substation, and up to four 80- to 90-m tall permanent met towers. In addition, five 60-m tall temporary met towers and a 2-m tall temporary Triton Wind Profiler have been installed within the Project Area and on surrounding land subject to easement agreements between landowners and CPV, which may remain during commercial operation. Refer to Section 6.5.3 for a description of the O&M building, Section 6.3 for a description of the substation, and Section 5.3 for a description of permanent and temporary met data collection facilities.

As noted in Section 4.1, minor facilities associated with the Project's electrical system include pad-mounted transformers at the base of each turbine, and a system of underground electrical collection lines. Additional details regarding the Project's electrical system are described in Section 6.3.

Additional temporary facilities associated with the Project will include a batch plant and laydown area during the construction period only.

4.4 Land Rights

CPV has secured the land rights necessary for construction and operation of the Project in the Project Area. CPV executed a road agreement with McIntosh County on April 6, 2010 in which CPV agrees to restore county roads that CPV has altered during construction of the Project to pre-construction conditions.

5. PROPOSED SITE

5.1 Identification of Project Area

The Project Area consists of approximately 17,400 acres of private land subject to easement agreements between landowners and CPV. The Project facilities will be located on land primarily consisting of pasture and cultivated cropland (wheat, soybeans, sunflowers, and corn) with a few rural residences and farmsteads. The Project Area is located in McIntosh County, approximately 6 mi north of the City of Ashley. Despite the overall size of the Project Area, the turbines and other wind farm infrastructure will occupy only approximately 0.4 percent of this area during operation. Table 5-1 presents a summary of proposed Project impact assumptions for both temporary impacts (construction footprint) and permanent impacts (operational footprint) based on the proposed Project layout, which is subject to change during micrositing (Figure 7).

Table 5-1. Estimated Project Impacts

Project Component	Temporary Impact (Acres)	Permanent Impact (Acres)	Total Impact (Acres)
Turbines	124	16	140
Access Roads	62	55	117
Miscellaneous Permanent Impacts (substation, O&M building, permanent met towers)	5.6	3.9	9.5
Miscellaneous Temporary Impacts (crane path, laydown area, batch plant, collection lines)	92.5	0	92.5
Total*	**261**	**73**	**334**

* Totals presented are less than the sum of the component impacts due to overlapping footprints of these features. The totals presented remove overlap to account for this issue.

About 261 acres will be disturbed temporarily during construction by the installation of: underground electrical collection lines; temporary crane crawl paths; access road widening to accommodate turbine delivery and crane movement; additional assembly and erection areas around the turbines, substation, and met towers; the batch plant; and a centralized laydown area for construction staging. Total permanent land disturbance for the Project is expected to be approximately 73 acres. See Section 7.0 for a detailed description of the Project Area impacts.

5.2 Wind Resource Areas – General

According to the United States Department of Energy (DOE) "Wind Resource Atlas of the United States," wind resources within the Project region consist of Class 4 winds or greater (Elliott et al. 1986). Class 4 winds have an average annual wind speed in the range of 16 to 17 mi per hour at 50 m height.

CPV has also acquired and analyzed meteorological information for the Project Area based on five temporary met towers and a Triton unit installed between 2008 and 2009. This information is described below.

5.3 Wind Characteristics in Project Area

Beginning in May and June of 2008, CPV installed two 60-m tall temporary met towers on land subject to easement agreements between landowners and CPV to assess the wind resource. A third temporary met tower was installed in June 2009 and a Triton Wind Profiler was positioned in July 2009. The fourth and fifth temporary met towers were erected in November 2009. CPV's meteorologist from RAM Associates selected the five monitoring locations to represent a variety of terrain characteristics across the Project Area and additional land outside the Project Area, but also party to easement agreements with CPV. Results from these studies and correlation to regional historic sources indicate that the yearly wind resource averages exceed those indicated by the DOE at hub height, which suggests that the net capacity factor of the proposed Project would be in the range of 40 to 48 percent. Site-specific wind characteristics indicate that the Project has highly suitable wind resource for economical, sustainable, and reliable production of power. In order to continue meteorological data collection over the lifetime of the Project and verify wind turbine power curves, up to four permanent met towers will be installed as part of the Project.

6. ENGINEERING AND OPERATIONAL DESIGN ANALYSIS

This section provides a summary of the Project layout and design, including turbines, electrical system, and associated facilities. Additional details are included in the Design Data Report (Appendix B). Specific design components addressed in this section are Project construction, schedule, operation, and decommissioning of the site.

6.1 Project Layout and Associated Facilities

The Project will consist of up to 87 wind turbines. In addition to the wind turbines the Project may include: improvements to existing roads; construction of new gravel access roads; installation of underground electrical collection lines; construction of an O&M building; erection of up to four 80 to 90 m tall permanent met towers as well as the potential installation of temporary SODAR units; and construction of an interconnection substation facility. A temporary staging and laydown area as well as a batch plant are also planned for the construction phase of the Project. The network of access roads, O&M building, and location of any on-site facility operating structures will utilize civil works and minimize disturbance on the site, yet provide optimal access to all turbines during operations. The proposed Project will interconnect to the MISO electric grid via an on-site 230-kV MDU transmission line and therefore no high voltage transmission line is required on or off site to interconnect the facility.

6.2 Description of Wind Turbines

CPV plans to use the Siemens Energy, Inc. SWT 2.3-101 or the General Electric (GE) 2.5xl, but reserves the right to select alternate turbines representative of the same class of turbine. Turbine type may affect the number of turbines and configuration of the turbine layout. The turbine layout provided in Project figures is based on the SWT 2.3-101 because it would require the greatest number of total turbines (87) and represents the most comprehensive study area; should the Project ultimately use GE 2.5xl turbines, only 80 of the 87 turbine locations evaluated in this application will be required. Details on the SWT 2.3-101 and the GE 2.5xl are presented below.

6.2.1 SWT 2.3-101

The SWT 2.3-101 has a 2.3-MW asynchronous generator and utilizes a three stage planetary-helical designed gearbox. For this turbine, 87 units will be constructed at the Project in rows running from southwest to northeast (Figure 7). Within rows, turbines are expected to be spaced approximately 0.25 mi apart while the rows themselves are expected to be spaced approximately 0.75 to 1.25 mi apart. The wind turbine will operate automatically, self starting when the wind speed reaches the designed cut-in speed of approximately 4 meters per second (m/s). Once rated power is achieved at approximately 12 to 13 m/s, the wind turbine will regulate to maintain the rated power. The wind turbine will shut down once the maximum operational limit of approximately 25 m/s is reached and restart automatically once the wind drops below a preset restart wind speed. The braking system during standard operation is through feathering of turbine blades, while a mechanical brake fitted to the gearbox provides additional safety.

The tower for this turbine has an 80 m hub height. The wind turbine will be mounted on a tapered tubular steel tower with internal ascent and direct access to the yaw system and nacelle. It will be equipped with platforms and internal electric lighting. The tower will be designed, fabricated, and constructed consistent for service in the design climatic conditions of the Project.

The rotor for this turbine has a 101 m diameter with a swept area of 8,000 m^2 and a rotor speed ranging from 6 to 16 rotations per minute (rpm). The rotor is a three-bladed cantilevered construction mounted upwind of the tower. A yawing system will rotate the rotor around the turbine to keep it upwind of the tower. The power output will be controlled by pitch regulation, with a variable rotor speed to maximize efficiency.

For communications and control, this turbine uses a Supervisory Control and Data Acquisition (SCADA) system, which allows remote control and monitoring of the status of all turbines in the Project. The monitoring system provides status views of electrical and mechanical data, operation and fault status, meteorological data, and grid station data.

Lightning protection will be consistent with the wind turbine supplier's design and specifications and local utility or code requirements. Individual components are designed with specific lightning protection systems. Some of the lightning protection systems, which will likely be employed, are lightning receptors, pick-up systems, integrated conductors along key components to ground, and surge arrestors.

6.2.2 GE 2.5xl

The GE 2.5xl has a 2.5 MW synchronous permanent magnet generator and utilizes a three-stage planetary-helical designed gearbox. For this turbine, 80 units will be constructed at the Project in rows running from southwest to northeast. Within rows, turbines are expected to be spaced approximately 0.25 mi apart, while the rows themselves are expected to be spaced approximately 0.75 to 1.25 mi apart. The wind turbine will operate automatically, self starting when the wind speed reaches the designed cut-in speed of approximately 3 m/s. Once rated power is achieved at approximately 12.5 m/s, the wind turbine will regulate to maintain the rated power. The wind turbine will shut down once the maximum operational limit of approximately 25 m/s is reached and restart automatically once the wind drops below a preset restart wind speed. The braking system during standard operation is through feathering of turbine blades, while a mechanical brake fitted to the gearbox provides additional safety.

The tower for this turbine has an 85 m hub height. The wind turbine will be mounted on a tubular steel tower with internal ascent and direct access to the yaw system and nacelle. It will be equipped with platforms and internal electric lighting. The tower will be designed, fabricated, and constructed consistent for service in the design climatic conditions of the Project.

This turbine can utilize a rotor that has either a 100 or 103 m diameter with a swept area of 7,854 m^2 or 8,332 m^2 and a maximum rotor speed of approximately 14 rpm. The rotor is a three-bladed cantilevered construction mounted upwind of the tower. A yawing system will rotate the rotor around the turbine, to keep it upwind of the tower. The power output will be controlled by pitch regulation, with a variable rotor speed to maximize efficiency.

For communications and control, this turbine also uses a SCADA system as described in Section 6.2.1 above. Lightning protection for this turbine will be consistent with that presented in Section 6.2.1 as well.

6.3 Description of Electrical System

The Project will interconnect to the on-site MDU Wishek to Tatanka 230 kV line. The electrical system gathers the individual electrical distribution systems from each turbine and turbine rows into the central step-up transformer and substation located on-site. The gathering system will be below grade to minimize impact on the area. Each turbine will likely have a pad mounted transformer stepping up the voltage to 34.5 kV to the centrally located substation on-site, which will step up the power to the 230 kV line rating.

The Project interconnection will be designed per NERC and MISO generator interconnection requirements. CPV is expected to execute a Large Generator Interconnection Agreement with MISO and MDU in the first half of 2011.

6.4 Project Construction

The Project's EPC firm will be an experienced firm with proven capabilities in complex power and industrial projects. The EPC firm will utilize a combination of direct hire employees, local trade subcontractors, subcontractors with wind experience, and necessary owned or rented construction equipment.

Construction activities expected for the Project and possible time frames for their completion include:

- Geotechnical survey and analysis for proper foundation design and materials expected to occur in mid to late 2010;
- Procurement of Project facility components expected to commence as early as mid 2011;
- Construction of access roads to be used for construction and maintenance expected to commence as early as mid 2011;
- Design and construction of the Project substation expected to commence as early as mid 2011;
- Installation of tower foundations expected to commence as early as mid 2011;
- Installation of underground cables and collection lines expected to commence as early as mid 2011;
- Tower assembly and wind turbine setting expected to occur as early as mid 2012;
- System testing of facility expected to occur as early as mid 2012; and
- Commencement of commercial production expected to occur during late 2012.

The final schedule of key EPC milestones will be dependent upon receipt of necessary approvals and permits, and consistent with an on-line date of no later than late 2012.

6.4.1 Construction Management

CPV will engage an experienced EPC firm and will directly oversee the construction with a CPV Construction Manager. The EPC firm will provide site project management, site supervision, procurement, site security, labor, and tools to construct and commission the facility.

The EPC firm construction manager shall be the lead and point of contact for all construction activities. The CPV Construction Manager shall be the liaison for CPV with agencies, local officials, and landowners, as well as managing of the EPC firm. The CPV Construction Manager shall remain in this role through the commissioning of the Project, at which point a CPV Asset Manager shall assume responsibility for the Project. Following commissioning and the declaration of facility commercial operation, the O&M staff shall take care, custody, and control of the facility from the construction organization. This O&M staff will be an experienced and highly regarded third-party Operator, with a dedicated plant manager and O&M staff on-site. The O&M staff shall have full responsibility for the facility to ensure O&M are conducted consistent with the approved permits, prudent industry practice, and equipment manufacturer recommendations for the turbines, civil works, buildings and grounds, and on-site electrical infrastructure.

6.4.2 Foundation Design

The foundation design will be an engineered foundation as required per the soil conditions and turbine manufacturer recommendations. The final design parameters of the foundations at the Project will be based upon geotechnical surveys, turbine tower load specifications, and cost considerations. Foundations for turbines are expected to have a volume of approximately 400 cubic yards and be constructed primarily from concrete and steel. The most common foundation shape is a spread footing, which can range in depth from approximately 7 to 10 ft and can range in width from approximately 16 to 20 ft at the top of the foundation to approximately 48 to 60 ft at the bottom of the foundation. CPV will contract with a registered professional engineer licensed to practice in the State of North Dakota for wind turbine foundation design.

6.4.3 Civil Works

Civil works will include the civil infrastructure, turbine foundations, and the underground electrical collection and grounding system. Specific activities expected at the Project include:

- Any necessary upgrading of roads required for transportation of equipment and components;
- Construction of any necessary crane hard-standings, road entrances, turnarounds, and access ways required for transportation and erection;
- Erection of facility structures, such as an O&M building;
- Erection of the on-site substation; and
- Burying of electrical cables.

Any improvements to existing public access roads will consist of re-grading and filling of the surface to allow access in inclement weather. No asphalt or other paving is anticipated.

Turbine access roads will be constructed along turbine strings or arrays. These roads will be sited in consultation with McIntosh County and in accordance with local requirements where applicable. They will be located to facilitate both construction and continued O&M. The roads will be covered with road base designed to allow passage under inclement weather conditions. The roads will consist of graded dirt and will be covered with an aggregate surface. Once construction is complete, the roads will be regraded, filled, and dressed as needed.

6.4.4 Commissioning

The Project will be commissioned after completion of the construction phase. The Project will undergo detailed inspection and testing procedures prior to final turbine commissioning. Inspection and testing will occur for each component of the wind turbines, as well as the communication system, meteorological system, obstruction lighting, high voltage collection and feeder system, and the SCADA system.

6.5 Project Operation and Maintenance

CPV's Operator will have a proven record of successful power operations and wind turbine operations. It is expected that the wind turbine supplier will be contracted to perform the maintenance on the wind turbines for a period of 2 to 5 years in addition to the Operator.

The turbines will be supplied with an on-board turbine control and monitoring system and a computerized analysis and data acquisition system. These systems will allow the Operator control and access/interface with the turbine remotely, and will include information on electrical and mechanical data, operation and fault status, meteorological data, and grid station data. A specific system is also expected that monitors the vibration level of the main components.

Specifically, the SCADA system will:

- Monitor wind farm status;
- Allow for autonomous turbine operation;
- Alert operations personnel to wind farm conditions requiring resolution;
- Provide a user/operator interface for controlling and monitoring wind turbines;
- Collect meteorological performance data from turbines; and
- Provide diagnostic capabilities.

These systems, along with a facility computerized maintenance and management system, will equip the Operator with the necessary tools for a robust predictive and preventive maintenance program and optimal operations and availability.

6.5.1 Maintenance Schedule

The maintenance schedule for the wind turbines and any balance of plant equipment will be consistent with prudent industry practices and original equipment manufacturer (OEM) recommendations. An initial maintenance inspection of each turbine will be performed after commercial operation. Following this initial inspection, each turbine will then receive annual inspections.

The turbine service and maintenance plan will likely include the following:

- First Service Inspection: Check the turbines, tighten bolts, and check lubricants. Will occur shortly after commissioning.
- Annual Service Inspections: Full component check and bolt assembly check. At specific intervals (1-3 years), the annual inspection will also include more significant inspections of the various components (wind braking system, lubricants, balance, terminal checks).

6.5.2 General Maintenance Duties

The Project shall be maintained in accordance with prudent industry standards and OEM recommendations. The on-site personnel shall perform, or cause to be performed, all operating and maintenance services for the Project, including, but not limited to, maintenance on the wind turbines, roads, buildings, and electrical infrastructure. Some common maintenance duties may include:

- Track and perform the maintenance schedule;
- Conduct or coordinate the execution of corrective maintenance;
- Maintain all parts and tools;
- Perform or cooperate with required wildlife monitoring and reporting; and
- Maintain all computer software and file any required reports.

6.5.3 Operations and Maintenance Building

The O&M building is designed to provide the on-site personnel housing for the operations of the wind facility, serving as the central administrative facility for the plant operations personnel and the critical controls and operations systems. The building will also be designed to serve as the maintenance center to allow the plant maintenance staff to conduct on-site diagnostics, repairs, predictive maintenance, and preventive maintenance that cannot be conducted in the field. This facility will also serve as the warehouse for critical spares.

6.6 Decommissioning and Restoration

CPV has made a commitment regarding decommissioning and restoration to all Project landowners in its easement agreements. CPV will dismantle and remove all equipment, improvements, fixtures and other property owned or installed by CPV on the landowner property as part of the decommissioning and restoration process.

CPV will conduct decommissioning and restoration consistent with the requirements of applicable regulatory agencies, including the PSC decommissioning requirements detailed in NDAC 69-09-09. CPV will file a decommissioning plan for review by the PSC prior to the commencement of facility operations, and will abide by all applicable rules pertaining to decommissioning adopted by the PSC. CPV reserves the right to consider alternatives to decommissioning, such as retrofitting the turbines and electric system with upgrades to extend the productive lifetime of the facility.

7. ENVIRONMENTAL ANALYSIS

This section provides a description of the environmental conditions that exist within the Project Area. Consistent with the Act, exclusion and avoidance criteria, as well as selection and policy criteria, were considered in the selection and design of the Project. To support this siting process, maps of the site were generated that indicate the presence or absence of many of the criteria included in NDCC 69-06-08-01. In addition, a number of environmental studies have been conducted and copies of preliminary reports regarding those studies are included in Appendix C. If different from the preliminary reports, finalized versions of the reports will be provided once completed. Substantive changes to the preliminary reports are not expected.

7.1 Description of Environmental Setting

The Project Area is located in McIntosh County in south-central North Dakota, approximately 6 mi north of the City of Ashley. The Project Area is located approximately 2,000 to 2,200 ft above sea level, and is characterized by rolling hills interspersed with isolated glacial pothole wetlands. Land use consists primarily of pasture and cultivated cropland (wheat, soybeans, sunflowers, and corn), with a few rural residences and farmsteads.

7.2 Socioeconomics

7.2.1 Description of Resources

McIntosh County encompasses 975.19 mi^2 and is located in southern North Dakota, on the border with South Dakota. In 2000, the U.S. Census Bureau reported that McIntosh County had 3.5 persons per mi^2 and a population of 3,390. The U.S. Census Bureau estimate for the 2008 McIntosh County population was 2,639, which is a 22.2 percent reduction in the population. In 2008, the U.S. Census Bureau reported that 98.8 percent of the population was composed of white persons who are not of Hispanic or Latino origin. The remaining 1.2 percent of the population are minorities. As of 2008, the median age in McIntosh County was 51 years. In 2000, approximately 80.6 percent of the population was 18 years and over, 34.2 percent were 65 years and older, and only 4.2 percent were under five years of age (U.S. Census Bureau 2000).

In 2007, the U.S. Census Bureau reported that the median family income for McIntosh County was $32,245, and that 14.3 percent were living below the poverty level. The 2000 U.S. Census Bureau reported that there were 861 single-family, owner-occupied homes that had a median value of $28,100. The homeownership rate in 2000 was 83.1 percent (U.S. Census Bureau 2000).

The labor force in 2000 was comprised of 1,466 individuals, or 52.1 percent of the population 16 years and older. There were 36 individuals, or 1.3 percent that were unemployed. In 2000, the industry within McIntosh County was comprised of 28.6 percent in educational, health and social services; 21.3 percent in agriculture, forestry, fishing and hunting, and mining; and 10.3 percent in the retail trade. All other industries in McIntosh County account for less than 6.5 percent, with the most substantial industry being finance, insurance, real estate, and rental and leasing at 6.2 percent.

Agriculture is a large part of the economy for McIntosh County. According to the USDA, there were 513 farms in McIntosh County in 2007 that averaged 1,072 acres per farm. The total market value for agricultural products produced was $75,862,000, which averaged $147,880 per farm. Sixty-six percent of agricultural product production came from crops for a total of $49,985,000. The remaining 34 percent, or $25,877,000, came from livestock sales (USDA 2007).

7.2.2 Impacts

Overall, the Project is expected to have positive impacts on landowners and McIntosh County. Construction and operation of the Project will result in a long-term beneficial impact on the county's tax base. This will contribute to improving the local economy and strengthening and diversifying the economic base of the region. Additionally, Project landowners whose land is utilized will receive payments throughout the life of the Project. This will further contribute to strengthening the local economy and its tax base. Finally, the construction of the Project may contribute to the development of wind-related businesses, such as blade testing facilities and specialized O&M companies in the area, which would further contribute to the economic growth of the region. A study conducted at the Langdon Wind Energy Center located in Cavalier County, North Dakota estimated that the North Dakota economy received more than $225 million from construction of that project (Leistritz and Coon 2008).

The Project will permanently impact approximately 73 acres of the total Project Area as a result of the construction of Project facilities. The permanent impacts of the final installed infrastructure and equipment will include turbine sites, access roads, an O&M building, permanent met towers, and a substation. Construction of these facilities will not cause additional impacts on the industry of the area. In general, landowners will be able to continue to use their property for agricultural or other purposes around turbine locations. The county is predominately Caucasian and the Project Area is not located in a concentrated low-income area. Therefore, there will be no impact on low-income families or minorities as a result of the Project.

Local contractors will be used to the extent practicable. Wages and salaries paid to local contractors will directly benefit the regional economy. Wages and salaries paid to non-local contractors will likely benefit the regional economy as well. This benefit will come in the form of expenditures for supplies, lodging, fuel, and other services such as hotels, restaurants, etc. Additionally, the McIntosh County economy will benefit from the infusion of state and local taxes paid by CPV. It is expected that the Project will generate over $1,000,000 per year in state and local taxes.

Certain components of the Project will require specialized labor that will be brought in from other counties or other states, such as turbine erection and commissioning. Specialized training of local labor for construction is not warranted given the short duration of Project construction. However, it is likely that training of local labor will be necessary for O&M during the life of the Project. It is anticipated that there may be as many as 12 full-time personnel on-site to perform O&M services. Local skilled labor for the basic infrastructure and site development needs of the Project is likely available within the county or the state and will be utilized to the extent practicable.

There are no anticipated impacts on permanent housing. Imported laborers will require temporary lodging. It is likely that imported laborers will use lodging facilities in either Ashley or Wishek. Some

limited permanent housing accommodations for specialized labor necessary during the life of the Project will also be required. These accommodations will likely be found in close proximity to the Project Area such as the town of Lehr. Unoccupied residences in towns such as Lehr will likely be rented or purchased, providing additional revenue to these areas. Additionally, permanent O&M workers may construct new residences in these towns bringing in additional work for local contractors and additional income to the tax base.

7.2.3 Mitigative Measures

The increase in the county's tax base and the infusion of wages, payments to landowners, and expenditures as a result of construction and operation of the Project will have positive impacts on the region. To a lesser extent, this infusion is expected to occur for the life of the Project from day-to-day O&M activities. The payments to landowners are expected to offset potential financial losses from the removal of land from agricultural production and substantially increase landowner income as a result of Project operation.

7.3 Land Use

7.3.1 Description of Resources

The current land use within the Project Area is primarily grassland/herbaceous and in agricultural production (Figure 11). The Project is not within any city limits and there are no known military installations in the area. There will be no displacement of occupied residences or industrial facilities as a result of construction and operation of the Project.

The USFWS has been purchasing grassland easements in the Prairie Pothole Region for the last 20 years. Native grasslands provide habitat for a multitude of species and these easements allow for their perpetual protection. There are 169 acres of USFWS grassland easements within the Project Area; these are located on the southern portion of the Project Area (Figure 8). Due to the limited size of grassland easements within the Project Area, the Project has been designed to avoid these areas completely.

The Farm Services Agency (FSA) administers the Conservation Reserve Program (CRP) to protect soil and water resources, with the Natural Resource Conservation Service (NRCS) providing technical land eligibility determinations, conservation planning, and practice implementation. CRP lands are removed from agricultural production and preserved for wildlife habitat for approximately 10 years' time. CPV is working with the FSA to have affected CRP lands removed from the program, if necessary, and provide compensation to the FSA for any reduction in CRP lands.

Based on review of available databases, aerial photographs, and site visits, the Project Area is primarily undeveloped grassland or in agricultural production. Table 7-1 lists all vegetative land cover types within the Project Area, which are also depicted on Figure 12.

Table 7-1. Vegetative Land Cover Within the Project Area

Vegetative Land Cover	Acreage	Percent of Vegetative Land Cover
Crop and Hay	6,777	40
Native Prairie	8,520	50
Tame Grassland	1,662	10
Other	59	<1
Total*	**17,018**	**100**

Source: Native Prairie Survey
* Total acreage assessed during vegetation field survey is less than total Project Area as wetlands and waterways have not yet been surveyed.

CPV is unaware of existing or planned industrial development in the vicinity of the Project. The nearest existing wind energy facilities are Tatanka Wind Farm and North Dakota Wind II, which are located approximately 18 mi to the southeast and northeast, respectively. Rough Rider I is a permitted wind project located in Dickey County approximately 16 mi to the east, but it has not been constructed yet. A fourth project, Merricourt, is currently in development approximately 10 mi to the east, near the border between McIntosh and Dickey Counties; however, this project is still in an early stage and has not yet undergone county or state permitting.

7.3.2 Impacts

Land use within the Project Area will largely remain unchanged as a result of the Project. Landowners often continue to plant crops and graze livestock to the edge of Project facilities at other wind farms throughout the United States. CPV will work closely with landowners during the development phase of the Project to minimize land use disruptions from the siting of Project facilities. CPV will also work with landowners to avoid impacts on drainage tiles and irrigation infrastructure during construction. Additional areas may need to be temporarily disturbed during construction for laydown areas and staging areas. However, these areas will be returned to their original contours and reseeded as necessary.

Based upon the layout presented in this application, a total of 73 acres, or 0.4 percent of the total Project Area land cover, will be permanently affected from construction of the Project.

In general, the public has historically expressed concerns over the potential devaluation of property values from the development of wind energy projects across the United States. Based on the best data currently available, there is no evidence to suggest that wind projects have a negative impact on property values. A study published by Hoen et al. in December 2009 found that the view and/or distance from homes of a wind facility do not have a statistically significant effect on sale prices. For this study, 24 wind facilities in nine states were analyzed with 7,429 sale transactions in the area. The transactions were analyzed by distance of turbines, timing of the home sale in relation to the public notice of the wind facility, and view. Other data concerning the locations of the transactions such as area amenities were also recorded during the three-year study. The results determined that while impacts on home sales could exist, those impacts are statistically insignificant. Impacts were also immeasurable for homes within 1 mi of the wind facility.

The Renewable Energy Policy Project (REPP) conducted a comprehensive study of U.S. projects in 2003 (Sterzinger et al. 2003). Based on three different analyses of real estate transactions within 5 mi of the 10 wind energy projects included in the study (i.e., property value trends throughout the entire study period, trends before and after construction of the wind energy project, and comparison of property value trends with comparable control communities), the REPP study concluded that there is no statistical evidence to suggest that wind farms have a negative effect on property values. Additionally, the Lawrence Berkeley National Laboratory recently released a power point presentation entitled, "The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis." The results of the study are presented below:

- Area Stigma: Homes in the study areas analyzed do not appear to be measurably stigmatized by the arrival of a wind facility;
- Scenic Vista Stigma: None of the various models find strong statistical evidence that the view of a nearby wind facility impacts sales prices in a significant and consistent manner; and
- Nuisance Stigma: Homes in the sample that are within 1 mi of the nearest wind facility, where various nuisance effects have been posited, have not been broadly and measurably affected by the presence of those wind facilities (Hoen et al. 2009).

Based on the results of these studies, it does not appear that the Project will have a direct negative impact on property values.

Additionally, no adverse cumulative effects due to the location of the Project in relation to existing or planned facilities and other industrial development are anticipated.

7.3.3 Mitigative Measures

CPV will work closely with the FSA, USFWS, and landowners in an effort to minimize impacts to sensitive areas to the extent practicable. The Project will not require the industrial use of non-renewable resources or emissions into the environment. To reduce potential impacts on occupied residences, turbines will be installed a minimum of 1,400 ft from occupied residences.

7.4 Public Services

7.4.1 Description of Resources

Local Services

The Project is located in a highly rural, lightly populated area in south-central North Dakota. Homesteads and farms within the Project Area, and small towns nearby, are served by an established transportation and utility network. The closest towns to the Project Area are Lehr (4.5 mi to the north), Ashley (6 mi to the south), and Wishek (7 mi to the northwest). Wishek has the largest population with 1,122 people, followed by Ashley with 882 people, and Lehr with 114 people (USCB 2000). The abandoned town of Danzig is also located 2 mi west of the Project Area.

Ashley is the county seat of McIntosh County. It provides sanitary water, sewer, utilities (e.g., natural gas and electricity) services, solid waste disposal services, educational facilities, and recreational facilities (e.g., a 9-hole golf course, two city parks, and opportunities for fishing, boating, skiing, and

camping at nearby Hoskins Lake). Ashley also provides emergency services, including a hospital with two clinics, a full-time police department, a volunteer fire department, a qualified emergency medical technician staff, and a qualified first response team (City of Ashley 2009).

Emergency services within the Project Area are provided out of Lehr, Ashley, and Wishek. The closest ambulance services to the Project Area are in Wishek and Ashley. The Project Area straddles three fire protection districts, including Wishek Fire Protection District in its northwestern portion, Lehr Rural Fire Department in its northeastern portion, and Ashley Rural Fire Department in its central and southern portions (NDGIS 2009).

Electrical Service

Two existing high voltage transmission lines, a MDU 230-kV line and a Basin Electric Power Coop 345-kV line, pass through the Project Area. Two substations are located in Ashley, including one MDU 42-kV substation and one KEM Electric Cooperative, Inc. (KEM) 42-kV substation. One MDU 230-kV substation is located in Wishek. Electrical service is distributed to the Project Area by KEM (2009).

Roads

The existing roadway infrastructure within the Project Area consists of county and township (section line) roads, typically comprised of gravel or packed dirt. No federal or state highways are located within or adjacent to the Project Area. The closest highways include: State Highway 13, which runs east-west through Lehr and Wishek approximately 3 mi north of the Project Area; State Highway 11, which runs east-west through Ashley approximately 6.5 mi south of the Project Area; and State Highway 3, which runs north-south from Wishek, approximately 6.5 mi west of the Project Area.

Traffic

Existing traffic volumes on the state highways in the vicinity of the Project are presented in Table 7-2 and Figure 9. Due to the complexity of determining the specific capacity of any highway, general estimates are used for planning purposes. For the purposes of this application, these estimates include Average Annual Daily Traffic (AADT) and Commercial Truck Traffic counts provided by the North Dakota Department of Transportation (NDDOT). For purposes of comparison, the functional capacity of a two-lane paved rural highway is approximately 5,000 vehicles per day. The state highways in the vicinity of the Project Area carry levels of traffic that are fairly typical for rural North Dakota, representing only a fraction of their capacities (NDDOT 2008).

No vehicle count estimates are available for the additional county and township roads that run through the Project Area. However, based on the condition, width, and function of these roads, they are likely to have far lower daily traffic than the nearby state highways.

Table 7-2. Existing Daily Traffic Levels

Roadway Segment	AADT/Commercial Truck Traffic
Highway 13 east of Lehr	370/70
Highway 13 west of Lehr	550/90
Highway 13 east of Wishek	950/95
Highway 11 east of Ashley	440/70
Highway 11 at Ashley	700/130
Highway 11 west of Ashley	460/115
Highway 3 north of Highway 11	260/70
Highway 3 south of Wishek	675/120

Source: NDDOT 2008

Water Supply

The Project Area is located entirely within an unincorporated, highly rural portion of McIntosh County. Water supply is assumed to be provided primarily from private groundwater wells for construction and operation. Drillers' logs from the North Dakota State Water Commission (NDSWC) indicate the presence of 16 private wells in the Project Area, including 15 stock wells and one domestic well (NDSWC 2009).

Telecommunications

Telecommunications infrastructure and services that could potentially be impacted by Project construction or operation include underground telephone and fiber optic cables, amplitude modulation (AM) and frequency modulation (FM) radio broadcasts, off-air television, non-federal government microwaves, and land mobile radio (LMR). The locations of underground communication cables in the Project Area will be identified by the respective utility companies prior to Project construction. Early in Project planning, CPV identified existing telecommunications services and assessed the potential for impacts of the proposed construction and operation of the Project through a review by Comsearch. Infrastructure and services within or near the Project Area include two off-air television stations with very limited programming (KJRE and K59BL), one non-federal government microwave beam path licensed to Basic Electric Power Cooperative that crosses through the center of the Project Area from northwest to southeast, and one LMR that is located approximately 1 mi south of the Project Area. Project planning has explicitly considered these services and sought to minimize impacts in the siting of turbines and other Project components. The telecommunications study conducted by Comsearch is attached as Appendix C.

7.4.2 Impacts

The Project is expected to have a minimal effect on the existing services and infrastructure in and nearby the Project Area. The following is a brief description of the impacts that may occur during construction and operation of the Project.

Local Services

No material impacts on local services are expected as the Project is relatively self-sufficient with respect to consumables and services. The number of full-time employees at the Project is expected

to be of a small enough number to benefit the tax base without having a detrimental impact on the ability of existing services (e.g., schools) to maintain the current level of service. The Project will utilize subcontractor services where such services are outside the routine capability of the plant staff, and such services will likely be of a specialized nature so as not to have an impact on the local community. However, where such local skills and services are available, those services would likely be utilized by the Project on an as-needed basis resulting in a beneficial impact on the local community.

Electrical Service

The Project will require electrical service from the local provider during the construction period and may also require electrical service during brief operational periods when the wind project is not generating electricity. No adverse long-term or significant impacts on the local rural electrical service are expected.

Roads

Construction of the Project will include approximately 10 mi of new gravel access roads. Both the new and existing roads will be up to 34-ft wide during construction, with low vertical relief to allow cross-travel by farm equipment. This improved and expanded transportation network will be used by construction vehicles during Project construction, and O&M crews inspecting and servicing the wind turbines during Project operation. The access roads will be sited between towers, with one road typically required for each string of turbines. Roads will be reduced to approximately 16 ft wide during operation and shoulders reseeded. Construction of roads will be conducted in conformance with applicable state laws and the road agreement between McIntosh County and CPV.

Traffic

Traffic impacts from the Project will be greatest during Project construction. Impacts may be most noticeable on the local county and township roads within the Project Area, which have particularly low existing traffic use. However, based on the existing traffic use and the rural nature of the area, the impacts from the additional construction-related traffic are expected to be minimal. Any impacts on county roads will be addressed in accordance with the road agreement between McIntosh County and CPV.

Trucks will likely access the Project Area from State Highways 11, 13, or 30; this will vary depending on the truck source and delivery destination. Operating permits (i.e., oversize or overweight) will be acquired from the state, county, and/or township, as necessary.

Water Supply

Construction and operation of the Project will not significantly impact the water supply. Project facilities are not likely to be sited near wells due to the fact that wells are typically sited in close proximity to the homesteads or farmsteads they serve, and turbines will not be sited within 1,400 ft of occupied residences. The Project will not require the abandonment of any wells, the appropriation of surface water, or permanent dewatering. Temporary dewatering of groundwater may be required during construction of turbine foundations and water may also be used at batch plants. It is likely that the Project will require a single domestic-sized well for the O&M facility with

additional water required for blade washing and dust control. Refer to Section 7.12 for detailed discussion of groundwater resources.

Telecommunications

Prior to Project construction, underground telephone and fiber optic cables will be located by the respective utility companies. Negative impacts on these buried telecommunications cables will therefore be avoided.

Available information indicates that there are no licensed operating AM/FM stations within a 15 mi search radius of the Project. Off-air television coverage in the Project Area includes very limited programming from two stations. Because off-air programming is so limited, it is likely that local residents supplement their television service with either cable or direct satellite broadcast, neither of which will be affected by wind turbines or other Project components.

Impacts on the one non-federal government microwave beam path that crosses the Project Area have been mitigated by avoiding the path's Worst Case Fresnel Zone (WCFZ), which is approximately 27.9 m (91.5 ft) in width along either side of the centerline of the microwave beam path. Turbines and other Project components have been located outside of the WCFZ to minimize interference (Figure 10).

Although one LMR is located approximately 1 mi south of the Project Area, very little, if any, change in the coverage of the repeaters will occur once the turbines are installed. In the unlikely event that there is a reported change in coverage attributable to the Project, it could be corrected by repositioning or adding repeaters that operate with the LMR system mobile units. Also, repeater antennas could be installed on utility, meteorological or turbine towers in the wind facility if needed.

7.4.3 Mitigative Measures

Construction and operation of the Project will be conducted in accordance with all associated local, state, and federal permits and regulations and industry standards. Based on the minor impacts expected to the existing public services and infrastructure from the Project, extensive mitigation measures will not be required.

Local Services

As noted, no impact on local services is anticipated; therefore, no mitigation is required. CPV will coordinate with local fire, police, and hospital facilities prior to construction and operation of the Project.

Electrical Service

In order to prevent adverse effects to the existing electrical transmission system, CPV will comply with NERC and MISO regulations and any requirements of their Interconnection Agreement, which specifically address electrical service. CPV will also use a turbine setback equal to 1.1 times the turbine blade tip height from existing transmission lines when siting wind turbines (Figure 10). No additional mitigation is necessary.

Roads

CPV will coordinate with landowners in order to site access roads in a manner that preserves existing land uses to the greatest extent practicable. CPV will also acquire all required state permits to ensure that road construction or widening is in conformance with applicable regulations and minimizes adverse impacts. CPV has a road agreement with McIntosh County to address the utilization of county roads during construction of the Project. CPV will also use a turbine setback equal to 1.1 times the turbine blade tip height from the center of county, state, and federal road right-of-ways.

Traffic

As noted, the traffic capacity of the existing road network is anticipated to be adequate to support Project-related traffic with minimal impacts. As such, no mitigation is proposed.

Water Supply

In the unlikely event that wells must be abandoned due to Project construction, they will be sealed as required by North Dakota law. Any temporary dewatering of groundwater during Project construction will be conducted under the requirements of the National Pollutant Discharge Elimination System (NPDES) permit and Storm Water Pollution Prevention Plan (SWPPP). Refer to Section 7.12 for additional mitigation measures related to groundwater resources.

Telecommunications

As noted, an underground utilities locator company will be contacted prior to construction to locate underground facilities. To the extent Project facilities cross or otherwise affect existing telephone or fiber optic lines or equipment, CPV will enter into agreements with service providers so as to avoid interference with their facilities.

Impacts on AM, FM, and off-air television broadcasts are expected to be minimal, and specific mitigative measures are therefore not proposed. Impacts on the single microwave beam path crossing the Project Area have been preemptively avoided through the siting of Project components outside of the WCFZ as shown on Figure 10. Although not anticipated, impacts on LMR could be mitigated, if necessary, by installing repeater antennas on met towers in the Project. In its easement agreement with Project landowners, CPV commits to using reasonable efforts to correct any degradation to television reception.

7.5 Human Health and Safety

7.5.1 Description of Resources

Air Traffic

Two general aviation airports are located within 7 mi of the Project Area: Wishek Municipal Airport (located 6 mi to the northwest) and Ashley Municipal Airport (located 7 mi to the south) (NDGIS 2009). Wishek Municipal Airport has one 3,450-ft long asphalt runway oriented roughly northwest-southeast at an approximate elevation of 2,038 ft above sea level. Ashley Municipal Airport has one 4,300-ft long asphalt runway oriented northwest-southeast and one 2,825-ft long turf runway oriented east-west. The airport is at an approximate elevation of 2,015 ft above sea level (AirNav 2009a; 2009b). USGS 1:24,000 scale topographic maps also depict two private landing strips

(Nietzsche Field and Rau Field) within 7 to 10 mi of the Project Area's southern boundary; however, these two landing strips are no longer utilized. The nearest commercial airport in North Dakota is Jamestown Regional Airport located approximately 60 mi northeast of the Project Area (North Dakota Aeronautics Commission 2009; NDGIS 2009).

Electromagnetic Fields

Every electrical device generates both electric and magnetic fields in its vicinity. These fields, referred to in combination as electromagnetic fields (EMF), arise from voltage, or electrical charges, and current, or the flow of electricity, associated with electrical systems. The intensity of any particular electric field is related to the voltage, while that of the associated magnetic field is related to the current. EMF can be present both outdoors and indoors, associated with large scale structures such as transmission lines, power collection lines, and substation transformers, as well as local household wiring and electrical appliances. The primary source of existing EMF within the Project Area is likely the two high voltage transmission lines that currently intersect it. The general scientific consensus is that electric fields pose no risk to humans.

Hazardous Materials / Hazardous Waste

The site is located in a relatively rural area of North Dakota that has not experienced significant industrial activity. CPV has nonetheless investigated the likelihood of environmental contamination from hazardous materials/waste through an Environmental Data Resources, Inc. (EDR) Database Search for Environmental Contaminants dated November 10, 2008. The EDR Database Search consisted of a computerized search of pertinent federal and state databases associated with potential subsurface contamination or hazardous materials within and near the Project Area. The search was performed pursuant to the American Society for Testing and Materials (ASTM) Standard E1527-05 using a database maintained by an independent consultant.

The EDR review did not identify any environmental database records within the Project Area or adjacent search areas. Because production of petroleum products is often regulated differently than storage of petroleum products, oil and gas production facilities are often excluded from the EDR database review. However, information from the North Dakota Industrial Commission (NDIC), Department of Mineral Resources, Oil and Gas Division (2009), indicates that petroleum production facilities are not present within the Project Area.

Since the completion of this review, no large industrial or commercial activities likely to produce hazardous wastes have been conducted within the Project Area. Nevertheless, a Phase I Environmental Site Assessment (ESA) of the Project Area will be performed following receipt of required permits and prior to construction to identify and assess thoroughly any recognized environmental conditions (RECs) that may exist.

Security

The Project is located in an area that has a low population density and crime rate (City of Ashley 2009). Impacts on the security and safety of local communities from construction and operation of the Project will be negligible. Wind turbine towers will be locked when O&M personnel are not utilizing the towers.

7.5.2 Impacts

Air Traffic

Due to the height of wind turbines, their installation creates a potential for obstruction to navigable airspace. However, similar obstructions are already present within the Project Area in the form of tall high-voltage transmission lines. Furthermore, the distance from existing airports to the Project Area mitigates potential aviation impacts. A desktop feasibility evaluation conducted by Aviation Systems, Inc. in September 2009 (Appendix C) indicated that, based on elevations within the Project Area and a maximum turbine height of 500 ft above ground level, the Project will not impact air traffic associated with nearby airports.

Electromagnetic Fields

The general scientific consensus is that electric fields pose no risk to humans. However, the relationship between magnetic fields and biological responses or health effects remains a subject of research and debate (National Institute of Environmental Health Sciences EMF-RAPID Program Staff 1999). EMFs will be associated with Project components, including turbines, collection lines, and the Project substation.

Hazardous Materials / Hazardous Waste

The Project will require the use of petroleum products, primarily including fluids with associated turbines and substation/transformer equipment. Each turbine will use three types of fluids derived from petroleum during operation: gear box oil, hydraulic fluid, and gear grease. Transformers will contain mineral oil. Heavy machinery used during Project construction will also use minor amounts of hydraulic fluid. Impacts include the potential for spills, leaks, and contamination from these sources if improperly stored and used.

Security

Project construction and operation will have minimal impacts on the security and safety of the local communities.

7.5.3 Mitigative Measures

Air Traffic

Early in Project planning, CPV contracted with Aviation Systems, Inc. to conduct a desktop evaluation of the Project from the perspectives of air traffic and aviation. CPV has proactively used the results of that September 2009 evaluation in developing a Project Area at a sufficient distance from local airports such that no impacts on air traffic are expected (Figure 10). CPV has submitted a Notice of Proposed Construction or Alteration to the Federal Aviation Administration (FAA) in accordance with Federal Aviation Regulations (FAR), Part 77. Turbine locations were submitted for review by the Federal Aviation Administration (FAA). The FAA issued a "Determination Of No Hazard To Air Navigation" with respect to all turbines on February 24, 2010 (Appendix D).

Electromagnetic Fields

CPV will set back wind turbines from all occupied residences, bury collection lines to a depth of approximately 4 ft, and fence off and place warning signs around the Project substation. Due to

these mitigative measures, EMFs will decrease to background levels at potential receptors (i.e., occupied residences) and the EMF generated by the Project is anticipated to have no impact on public health and safety.

Hazardous Materials / Hazardous Waste

A Phase I ESA, conducted in conformance with the ASTM standard, will be used to minimize risk associated with any potentially existing recognized environmental conditions that may pose a threat to human health and safety. Significant findings are not anticipated due to the known historic uses of the properties and the previously conducted EDR review.

CPV does not anticipate generating any hazardous wastes, although minor amounts of petroleum products will be used during Project construction and operation. Any petroleum wastes generated will be handled and disposed of in accordance with local, state, and federal regulations. Additional handling, storage, and reporting requirements for hazardous material will be covered in association with the NPDES permit application and SWPPP.

Security

CPV will follow security measures in order to reduce the chance of damage to physical property and personal injury, including:

- Siting of wind turbines away from potential receptors such as occupied residences and the centers of road right-of-way, using setbacks of 1,400 ft and 1.1 times turbine tip height, respectively. These setback distances are considered appropriate based on developer experience and examples set by other wind projects in North Dakota. These distances will also serve to mitigate EMF levels (as discussed above), as well as sound.
- Use of temporary and permanent precautions during construction and operation, such as safety fences, warning signs, and locks on equipment and wind power facilities.

For most turbines, all associated electrical equipment, with the exception of the pad-mounted transformers, will be contained within the solid steel enclosed tubular towers on which the turbines are mounted. Access to the tower will be restricted to a single solid steel door to be locked when not in use. The Project substation will have applicable warning signs and will be fenced and locked.

7.6 Shadow Flicker

7.6.1 Description of Resources

A wind turbine's rotating blades can cast a moving shadow on locations within a certain distance of a turbine. These moving shadows are called shadow flicker, and can be a temporary annoyance to people at nearby occupied residences or public gathering places. The potential impact area depends on the time of year and day (which determines the sun's azimuth and altitude angles) and the wind turbine's physical characteristics (height, rotor diameter, blade width, and orientation of the rotor blades). Shadow flicker generally occurs during low angle sunlight conditions, typical during sunrise and sunset times of the day. However, when the sun angle is very low (less than 3 degrees), the light has to pass through more atmosphere and becomes too diffuse to form a coherent shadow. Shadow

flicker will not occur when the sun is obscured by clouds/fog, at night, or when the source turbine is not operating.

Shadow flicker intensity is defined as the difference in brightness at a given location in the presence and absence of a shadow. Shadow flicker intensity diminishes with greater receptor-to-turbine separation distance. In general, the largest number of shadow flicker hours, along with greatest shadow flicker intensity, occurs nearest the wind turbines.

7.6.2 Impacts

Shadow flicker frequency is related to the wind turbine's rotor blade speed and the number of blades on the rotor. The blade pass frequency for any of the wind turbines that may be selected will be less than 1.0 Hertz (Hz) (less than 1 alternation per second). From a health standpoint, such low frequencies generated by wind turbines are harmless. Public concerns that flickering light from wind turbines can have negative health effects, such as triggering seizures in people with epilepsy, are unfounded. Epilepsy Action (working name for the British Epilepsy Foundation) states that there is no evidence that wind turbines can cause seizures (Epilepsy Action 2008). However, they recommend that wind turbine flicker frequency be limited to 3 Hz. Since the blade pass frequency for any of the wind turbines that may be selected will be less than 1.0 Hz, no negative health effects to individuals with photosensitive epilepsy are anticipated.

Shadow flicker impacts are not regulated in applicable state or federal law and there is no permitting trigger with regard to hours per year of anticipated impacts on a receptor from a wind energy project. However, a general precedent has been established in the industry both abroad and in the United States that fewer than 30 hours per year of shadow flicker impacts is acceptable to receptors in terms of nuisance and well below health hazard thresholds. In a German court case for example, a judge found 30 hours of actual shadow flicker per year at a certain neighbor's property to be tolerable (WindPower 2003). CPV is committed to completing a shadow flicker analysis for the Project, and the report will be provided to the PSC as a supplemental filing to this application prior to the Certificate hearing. The results of the shadow flicker analysis are pending; however, shadow flicker impacts are anticipated to be minor due to the low number of sensitive receptors (occupied residences) in the Project Area, the 1,400 ft setback of turbines from occupied residences, as well as the Project Area's geographical and meteorological conditions.

7.6.3 Mitigative Measures

CPV will mitigate shadow flicker impacts from the Project through the setback distances employed for wind turbines. The setback of at least 1,400 ft occupied residences acts as a mitigation measure to minimize potential adverse shadow flicker impacts. Additional mitigation measures such as strategic vegetative screening at affected occupied residences and/or installation of curtains and blinds on the windows facing the turbine casting the shadows are effective and economically viable options that CPV will consider on an individual basis with landowners, if necessary.

7.7 Sound

7.7.1 Description of Resources

McIntosh County would generally be characterized as agricultural and rural, and existing ambient sound levels are expected to be relatively low, although sound levels can be sporadically elevated in localized areas during periods of human activity. Background sound levels will vary both spatially and temporally depending on proximity to area sound sources and natural sounds. Principal contributors to the existing acoustic environment likely include motor vehicle traffic, mobile farming equipment, farming activities such as plowing and irrigation, all-terrain vehicles, local roadways, rail movements, periodic aircraft flyovers, and natural sounds such as birds, insects, and leaf or vegetation rustle during elevated wind conditions in areas with established tree stands or established crops. Diurnal effects result in sound levels that are typically quieter during the night than during the daytime, except during periods when evening and nighttime insect sound dominate.

7.7.2 Impacts

McIntosh County has not adopted a zoning ordinance or any specific noise-related provisions. At the state level, the NDAC (Article 69-06-08, Section 3) requires that the potential for adverse impacts at noise sensitive areas (NSAs) be assessed during the site selection process; however, there are no numerical decibel limits or formal compliance guidelines provided either by the PSC or any other agency at the state level. Based on a review of regulations and precedent set by other recently permitted wind energy projects in the area, it is expected that a baseline sound survey, which measures the existing noise levels in an area and sets a "baseline" for purposes of comparison, is not required by the PSC to show Project compliance.

Potential acoustic impacts associated with Project construction and operation are being assessed. For Project operation, a screening-level acoustic modeling analysis will be conducted using CadnaA, a comprehensive three-dimensional acoustic software model that conforms to the Organization for International Standardization (ISO) standard ISO 9613-2 "Attenuation of Sound during Propagation Outdoors." Using manufacturer sound specifications, the selected Project layout, site-specific terrain and topography, and specialized wind turbine modeling techniques, received sound levels at NSAs will be calculated for operation ranging from cut-in to maximum rotational wind speeds. Maximum received sound levels at each NSA will be compared against appropriate environmental noise criteria such as that prescribed by the United States Environmental Protection Agency (USEPA). Project background information, a regulatory criteria overview, a discussion of the acoustic modeling methodology, comparison to applicable limits, and final analysis conclusions will be contained within the Project acoustic impact assessment. The results of the acoustic assessment are pending; however, impacts are not anticipated to be unreasonable or inconsistent with similar wind energy projects due to the low number of sensitive receptors (occupied residences) in the Project Area and the 1,400 ft setback of turbines from occupied residences.

7.7.3 Mitigative Measures

CPV will mitigate sound impacts from the Project through setback distances employed for wind turbines. The setback of at least 1,400 ft from occupied residences mitigates and minimizes potential adverse sound impacts at NSAs.

7.8 Cultural and Archeological Impacts

7.8.1 Description of Resources

Cultural resources include archeological sites, standing structures, objects, districts, traditional tribal properties, and other properties that illustrate important aspects of prehistory or history or have important and long-standing cultural associations with established communities or social groups. CPV conducted a Class I cultural resources survey (Survey) to identify possible Project effects on archeological sites and historic architectural resources that are potentially eligible for listing in the National Register of Historic Places (NRHP) and/or State Historic Sites Register (Tetra Tech 2010), as provided in Appendix C. The Survey included review of previously recorded cultural resources and identification of cultural contexts that might aid evaluation of significant cultural resources. The Survey was conducted in anticipation of consultations with the North Dakota State Historic Preservation Office (SHPO), and in compliance with Section 106 of the National Historic Preservation Act (NHPA).

Local and regional studies suggest that Native Americans might have occupied the Project Area over the last 12,000 years (Gregg et al. 2008). Ethnohistoric accounts suggest that the area of McIntosh County was occupied during the eighteenth and nineteenth centuries by shifting populations of Cheyenne, Lakota, Dakota, Yankton and Yanktonai (Schneider 2002). SHPO's North Dakota Cultural Resource Survey (NDCRS) site files indicate that Native American archeological sites in McIntosh County commonly included cultural material scatters and stone circles, often found on hills and ridges. Local histories also stated that Native American archeological sites were common near ponds and streams (Wishek 1941:41-42). Many archeological sites with stone circles and/or rock cairns have been disturbed during historic period field clearing and plowing.

The first Euro-Americans moved to McIntosh County in 1884, and settlement progressed rapidly over the following 25 years (Wishek 1941). Most settlers were Russian immigrants of German heritage. Research questions about pioneer settlements, ethnicity and changing rural society and economy are important local and regional cultural contexts. Historic period archeological sites might be indicated by mapped historic structures. A 1911 atlas indicates that the Project Area contained one mapped cemetery, one church, one school, and 38 undifferentiated structures (probably both dwellings and agricultural outbuildings) (Ogle 1911). Many of these mapped structures were abandoned or demolished and may be associated with archeological sites. The Project Area has at least four historic cemeteries that are protected by state statutes (NDCC 23-06-27 and 40-02-03). The cemeteries include: the Salem German Congregational Cemetery in T131N, R70W, Sect. 23; the George Stanton German Baptist Cemetery in T131N, R69W, Sect. 05; and the Bethany #1 and Bethany #2 Cemeteries in T131N, R69W, Sect. 22 (Karms 1973). Mapped historic structures and standing structures might be associated with archeological sites, including perhaps unmarked graves.

NDCRS site files contained records for one archeological site in the Project Area. This is prehistoric site 33MT049, a series of Native American stone circles located in T131N, R69W, Sect. 19. No historic architectural resources or NRHP-listed properties have been recorded in the Project Area. The only property listed on the NRHP in McIntosh County is the McIntosh County Courthouse, located approximately 6.5 mi south of the Project Area.

The small number of reported archeological sites and historic architectural resources in the Project Area reflect the rarity of archeological and architectural surveys. Historic maps indicate many cultural landscape features that might contain archeological sites. Limited field observations conducted for the Survey did not reveal extensive ground disturbances from erosion, surface mining or previous construction that might have destroyed archeological sites. In summary, there is potential for prehistoric Native American archeological sites and historic Euro-American archeological and architectural resources in the Project Area.

7.8.2 Impacts

Based on their review of the Survey report, SHPO may request additional information about whether unrecorded archeological sites or historic architectural resources will be affected by the proposed Project. The area of potential effect (APE) for archeological resources will include locations that may undergo possible ground disturbances resulting from construction, operation and decommissioning of Project facilities. The APE for historic architectural resources might include an area of visual effects to be determined in consultations with SHPO. SHPO may require a Class III archeological field investigation in areas of proposed Project construction. SHPO may also require additional documentation of historic architectural resources. If required, archeological and architectural field investigations will follow SHPO guidelines for archeological surveys and historic architectural investigations.

7.8.3 Mitigative Measures

CPV will continue consultations with SHPO through TVA as the lead federal agency under Section 106 of the NHPA concerning possible Project impacts on cultural resources. CPV is considering several mitigative measures during Project design to avoid or reduce impacts on possible cultural resources in the APE:

- Project designs will avoid construction around ponds and stream drainages to the extent practicable where prehistoric and historic sites may be located;
- Mapped historic structures will be avoided to the extent practicable to reduce impacts on potential archeological sites, architectural resources, and possible unmarked graves;
- All marked cemeteries and recorded archeological sites will be avoided during Project planning (Figure 4 and Figure 10);
- Project setbacks from extant roads and occupied buildings will have the added benefit of reducing impacts on some historic period archeological sites and architectural resources, if present; and
- An *Unanticipated Discoveries Plan* will be prepared that describes procedures to be followed if archeological sites and/or human remains are unexpectedly encountered during Project construction.

7.9 Recreational Resources

7.9.1 Description of Resources

Recreational opportunities in McIntosh County include fishing, hunting, wildlife/bird observation, boating, skiing, and camping (Ruff 2009; City of Ashley 2009). Local recreational facilities near the Project Area include the Ashley and Wishek 9-hole public golf course, as well as two city parks in Ashley (Dakota Heartland Champion Community 2009; City of Ashley 2009).

There is one North Dakota State Recreation Area in McIntosh County; Doyle Memorial State Recreation Area located 2.5 mi west of the Project Area. In addition, eight state Wildlife Management Area (WMAs) are located within McIntosh County, four of which are within 5 mi of the Project Area, as shown on Figure 8 (Green Lake WMA, Clear Lake WMA, Ashley WMA, and Lehr WMA). The closest WMA is Green Lake WMA, located approximately 1 mi west of the Project Area. WMAs are open to a variety of public uses, including but not limited to hunting, fishing and trapping (NDGIS 2009). There are also several parcels of land enrolled in the North Dakota Private Lands Open to Sportsmen (PLOTS) program, which provide public access to private lands for hunting. One quarter section of PLOTS is located within the Project Area, near its southern boundary (NDGFD 2010).

There are no National Park Service (NPS) lands within McIntosh County or neighboring counties, with the closest site being Knife River Indian Villages National Historic Site, approximately 120 mi from the Project Area. The Project Area is adjacent to multiple USFWS WPAs, including one WPA (Geisler WPA) present as an inholding of non-leased land within the Project Area boundary (NDGIS 2009). WPAs are part of the National Wildlife Refuge System and preserve wetlands and grasslands critical to waterfowl and other wildlife. WPAs are open to a variety of public uses, including hunting, trapping, fishing, and wildlife observation and photography.

7.9.2 Impacts

In general, impacts on nearby recreational areas will be visual in nature, primarily affecting individuals using public or private property within or adjacent to the Project Area for hunting, fishing, trapping, or nature observation. To minimize physical intrusion on recreational activities, Project turbines, buildings, and the substation will be sited at least 0.25 mi from nearby WPAs. Additional impacts on recreational uses due to the Project include increased traffic along county roads in the area, although these impacts will be temporary in nature and primarily associated with the construction period. During construction, local wildlife may be temporarily displaced but then return to the area during Project operations. Finally, potential impacts on the avian species associated with the WPAs are addressed in Section 7.16.

7.9.3 Mitigative Measures

Wind turbines, substations, and O&M buildings will be sited at least 0.25 mi from nearby WPAs in order to mitigate direct, physical impacts preemptively to recreational resources within and adjacent to the Project Area. Mitigative measures proposed relative to traffic are included in Section 7.4. Because the Project will not result in the removal or deterioration in functional value of nearby

recreational facilities, CPV does not propose compensational conversion or dedication of adjacent land to recreational use or wildlife management.

7.10 Effects on Land-Based Economies

7.10.1 Description of Resources

Agriculture/Farming

Agricultural lands (hay and crop) comprise approximately 40 percent of the Project Area (Table 7-1). Landowners also use their property for pasturing animals.

According to the 2007 Census of Agriculture, the top crop item for McIntosh County is wheat (93,336 acres) followed by forage land for hay, grass silage, and greenchop (57,022 acres) (USDA 2007). Other crops grown in McIntosh County include soybeans, sunflowers, and corn. Cattle were the primary livestock in McIntosh County in 2007. In 2007, McIntosh County had 513 farms comprising 549,685 acres. This is a slight decline from 2002 when McIntosh County had 526 farms comprising 568,544 acres. Crop sales accounted for 66 percent of products sold in 2007, while livestock sales represented 34 percent of products sold (USDA 2007).

The NRCS mapped soil units within the Project Area include prime farmland and farmlands of statewide or local importance (Figure 13). Prime farmland and farmlands of statewide importance are lands that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Farmlands of statewide importance generally do not produce a yield as high as prime farmland, but can if conditions are favorable and the land is treated and managed according to acceptable farming methods. Prime farmlands in McIntosh County are presented in Table 7-3 below.

There is only one prime farmland soil within the Project Area. This soil comprises 15 acres or less than 0.1 percent of the Project Area. There are two soils that are considered prime farmland when drained. These comprise 58 acres or approximately 0.3 percent of the Project Area. Additionally, the Project Area contains 297 acres or approximately 1.7 percent of farmland of statewide importance.

Table 7-3. Prime Farmland Soils in McIntosh County

Soil Unit	Prime Farmland	Prime Farmland If Drained	Farmland of Statewide Importance	Area (acres)	Percentage of Project Area (17,385 acres)
Bearden silt loam, 0 to 2 percent slopes	X			15	0.1
Marysland loam		X		52	0.3
Colvin silt loam		X		6	0.0
Williams-Bowbells loams, 0 to 3 percent slopes			X	105	0.6
Arnegard loam, 0 to 6 percent slopes			X	87	0.5
Williams-Bowbells loams, 3 to 6 percent slopes			X	73	0.4
Hamerly loam, 0 to 3 percent slopes			X	22	0.1
Makoti silty clay loam, 0 to 3 percent slopes			X	10	0.1

Woodlands

Economically important forestry resources are not found in the Project Area. The 2007 Census of Agriculture has no record of any market value for cut Christmas trees and short rotation woody crops in McIntosh County. Generally trees are limited in the Project Area and are associated with drainages and shelter belts around homesteads, which have limited economic value.

7.10.2 Impacts

Agriculture/Farming

The Project will not have a significant impact on grazing or pasture land. Only permanent facilities such as physical turbine locations and access roads will reduce the amount of grazing land available. All land surrounding these facilities will remain available for grazing. Therefore, no impacts are anticipated to animal health and safety as a result of construction and operation of the Project.

All temporary disturbances, estimated to be approximately 105 acres, will be restored to pre-construction conditions.

Lease payments will provide farmers with supplemental income that will be significantly greater than any potential losses due to operation of the Project. Lease payments will typically contribute more income per acre than the market value per acre for agricultural production. It is anticipated that no prime farmland and 0.4 acre of farmland of statewide importance will be permanently disturbed from operation of the Project according to the proposed layout. This impact is considered negligible when compared to the agricultural production of the rest of the county. During construction and operations, CPV will reimburse landowners for damaged crops as specified in the easement agreement between CPV and the landowner.

As discussed in Section 7.3.2, there are no negative impacts anticipated to the valuation of homes in the area. The Project layout will be designed to ensure that no turbines will be placed within 1,400 ft of occupied residences. While the exact impact will not be known until the Project layout has been finalized, the loss of land from construction and operation of the Project will have minimal impact on agricultural production. Any impacts caused by construction and operation of the Project will be more than offset by lease payments.

Woodlands

There are no anticipated significant impacts on woodlands.

7.10.3 Mitigative Measures

Agriculture/Farming

Available data will be analyzed and landowners will be consulted to minimize impacts on prime farmland and other productive farmland areas in the final Project layout. Only land for turbines, substation, O&M building, and access roads will be unavailable for crop production during the life of the Project. All construction areas will be separated from grazing animals. The loss of land from construction and operation of the Project will have minimal impact on agricultural production. Any impacts caused by construction and operation of the Project will be more than offset by lease payments.

Woodlands

There are no anticipated significant impacts on woodlands.

7.11 Soils

7.11.1 Description of Resources

North Dakota, including McIntosh County, was subject to glacial migration and as a result has surface boulders and scraped out depressions. Soils within a few feet of the surface are generally a fine loam with glacial till. The USDA has mapped 32 soil map units within the Project Area (Figure 14) (USDA 2008). These soils are primarily well-drained loams derived from underlying till, glaciofluvial sediments, and alluvial sediments. Five soil types comprise over 85 percent of the Project Area. The most extensive of these are "Zahl-Williams loams, 9 to 15 percent slopes" (approximately 33 percent of the Project Area), "Zahl-Williams loams, 6 to 9 percent slopes" (approximately 18 percent), and "Zahl-Max loams, 15 to 60 percent slopes" (approximately 16 percent). Table 7-4 provides a summary of the soil map units within the Project Area, including their acreages and percentages of the Project Area.

Approximately 2 percent of the soils within the Project Area are prime farmland, prime farmland if drained, or farmland of statewide importance. More than half of the Project Area (64 percent) is underlain by partially hydric soils (i.e., soils containing hydric inclusions); however, soils classified as entirely hydric comprise only 4 percent of the Project Area (USDA 2008).

Table 7-4. SSURGO Soil Map Units Within the Project Area

Map Unit Name	Area (acres)	Percentage of Project Area (17,385 acres)
Zahl-Williams loams, 9 to 15 percent slopes	5651	32.5
Zahl-Williams loams, 6 to 9 percent slopes	3126	18.0
Zahl-Max loams, 15 to 60 percent slopes	2725	15.7
Williams-Zahl loams, 3 to 6 percent slopes	1824	10.5
Wabek-Appam sandy loams, 6 to 25 percent slopes	1507	8.7
Max-Zahl-Arnegard loams, 9 to 35 percent slopes, very stony	664	3.8
Wabek-Lehr complex, 2 to 6 percent slopes	472	2.7
Parnell silty clay loam	338	1.9
Southam silty clay loam	264	1.5
Williams-Bowbells loams, 0 to 3 percent slopes	105	0.6
Water	105	0.6
Arnegard loam, 0 to 6 percent slopes	87	0.5
Williams-Bowbells loams, 3 to 6 percent slopes	73	0.4
Hamerly-Parnell complex, 0 to 3 percent slopes	61	0.4
Wabek-Appam sandy loams, 0 to 6 percent slopes	56	0.3
Marysland loam	52	0.3
Stirum fine sandy loam, 0 to 1 percent slopes	49	0.3
Harriet loam, 0 to 2 percent slopes	46	0.3
Makoti-Rusklyn silty clay loams, 2 to 6 percent slopes	37	0.2

Map Unit Name	Area (acres)	Percentage of Project Area (17,385 acres)
Hamerly and Vallers loams, saline, 0 to 3 percent slopes	23	0.1
Hamerly loam, 0 to 3 percent slopes	22	0.1
Noonan-Williams loams, 0 to 6 percent slopes	18	0.1
Appam sandy loam, 0 to 6 percent slopes	16	0.1
Bearden silt loam, 0 to 2 percent slopes	15	0.1
Lehr-Bowdle loams, 2 to 6 percent slopes	11	0.1
Makoti silty clay loam, 0 to 3 percent slopes	10	0.1
Bowdle-Lehr loams, 0 to 2 percent slopes	10	0.1
Schaller loamy sand, 6 to 15 percent slopes	7	0.0
Colvin silt loam	6	0.0
Pits, gravel and sand	5	0.0
Williams-Zahl-Parnell complex, 0 to 15 percent slopes	1	0.0
Rusklyn silty clay loam, 2 to 6 percent slopes	0	0.0

Source: USDA 2008

Although all of the soils in the Project Area (with the exception of areas mapped as "Water") have low to moderate susceptibility to erosion by water (i.e., K-factors from 0.1 to 0.4), the majority (81 percent) have a moderate to high susceptibility to wind erosion (i.e., USDA Wind Erosion Groups 5 or less) (USDA 2008).

7.11.2 Impacts

Impacts on soils within the Project Area will consist primarily of the removal of areas from agricultural production by occupancy of Project components. In isolated cases, grading may be required for roadway construction. Estimated impacts include approximately 73 acres of permanent disturbance due to turbines, met towers, access road construction or widening, the Project substation, and the O&M facility. Because of the deliberate siting of facilities on level terrain, outside of wetland areas, the potential for soil loss due to erosion or impacts on hydric soils, such as compaction, is low.

7.11.3 Mitigative Measures

Following construction, CPV will restore disturbed areas to pre-construction conditions. Soil erosion, compaction, and other related disturbance will be minor and short-term, and will be minimized by implementing environmental protection measures in accordance with the SWPPP. These measures will include BMPs for erosion and sediment control, such as temporary seeding, permanent seeding, mulching, filter strips, erosion blankets, and sod stabilization. If cuts are made during construction, top soil will be segregated and reapplied after final contours have been graded. With the proper implementation of environmental protection measures intended to prevent, minimize, and/or reclaim soil erosion, compaction, and spill effects, no unmitigated loss of highly productive soil will result from the Project.

7.12 Geologic and Groundwater Resources

7.12.1 Description of Resources

South-central North Dakota lies within the Glaciated Missouri Plateau section of the Great Plains physiographic province. McIntosh County is located entirely within the Glaciated Missouri Plateau, spanning its two easternmost physiographic districts, the Missouri Coteau to the east and the Coteau Slope to the west. The Project Area is located entirely within the Missouri Coteau, an area of thick glacial sediments characterized by hilly topography and numerous, isolated small lakes and ponds that comprise a non-integrated drainage system (Clayton 1962).

The primary process responsible for shaping the physiography of the Project Area is large-scale glacial stagnation (i.e., long periods during which glaciers remained relatively static, neither advancing nor retreating) during the Wisconsin Glaciation. The topography of the Project Area is dominated by the Burnstad end moraine, a low, broad ridge of knobby hills with moderate local relief (typically 15 or 20 ft) and steep slopes (up to 15 degrees) that extend northwest from the Project Area to the northwestern portion of Logan County. The eastern extent of the Project Area varies slightly from the rest, consisting of dead-ice moraine characterized by more moderate topography and more numerous small waterbodies (Clayton 1962; NDGS 1980).

The surficial geology of the Project consists of end-moraine and dead-ice moraine glacial tills of Quaternary Coleharbor Formation. These tills are texturally heterogeneous (i.e., consisting of clays, silts, sands, gravel, and boulders) and are typically deep, ranging from 50 to 300 ft thick. Along the western extent, the sediments consist of collapsed glacial outwash sands and gravels (Clayton 1962; NDGS 1980).

The surficial sediments of the Project Area are underlain by the Upper Cretaceous Fox Hills and Pierre Formations. The Fox Hills is the younger of the two formations; however, both are flat-lying and their contact is not well defined in the area of the Project due to the thickness of surficial sediments and the lack of bedrock outcrops. Both formations were deposited in a marine environment. The Fox Hills formation consists of interbeds of weakly consolidated or unconsolidated sand and mudstone and well consolidated sandstone, siltstone, claystone, and shale. It is abundantly fossiliferous in some locations. The Pierre Formation is a thick unit of dark gray to black marine shale (Clayton 1962; NDGS 2001). Within the Project Area, both of these formations are deeply buried under surficial glacial sediments (Clayton 1962; NDGS 1980).

According to the North Dakota Geological Survey, North Dakota is located in an area of very low earthquake probability. There are no known active tectonic features in south-central North Dakota and the deep basement formations underlying North Dakota are expected to be geologically stable (Bluemle 1991). This information is supported by USGS seismic hazard maps, which show that the Project Area is located in an area with very low seismic risk (USGS 2008). Related geologic hazards, such as soil liquefaction, are consequently also unlikely. Other potential geologic hazards, such as subsidence due to karst topography, have not been identified (Tobin and Weary 2005).

The primary geologic-related resources in McIntosh County are sand and gravel. These resources are extremely abundant (Clayton [1962] described them as "nearly unlimited"). USGS topographic maps

depict two sand and gravel pits within the Project Area, one near the center and one at the western extent. The status of these two operations is uncertain; however, the central facility corresponds to a 5-acre area mapped as "Pits, gravel and sand" by the USDA soils (SSURGO) database (USDA 2008). The Project Area is not located in an area with economic reserves of hydrocarbons, as supported by information from the NDIC, Department of Mineral Resources, Oil and Gas Division (2009), including well locations, mapped oil and gas fields, and monthly oil and gas production totals.

Groundwater is the primary source of water for municipal, domestic, and livestock needs in McIntosh County. Groundwater resources are available from aquifers in both surficial glacial sediments and Cretaceous bedrock. Within the Project Area, the primary sources of groundwater are glacial surficial sediments and the Fox Hills Formation. Water from both sources is typically hard to very hard. Well yields within the Project Area are generally less than 50 gallons per minute (gpm) (Klausing 1981). Review of driller logs available from the NDSWC indicates that 16 private wells have been drilled within the Project Area, including 15 stock wells and one domestic well. Well logs indicate that static water levels in the Project Area range mainly from about 20 to 25 ft below ground surface (bgs); however, static water depths as shallow as 6 inches and as deep as 80 ft have also been recorded (NDSWC 2009).

7.12.2 Impacts

Impacts of the proposed Project to available geologic resources are likely to be limited. Due to the thickness of surficial materials, excavation or blasting of bedrock is extremely unlikely. In the event that active commercial sand and gravel extraction facilities are present within the Project Area and cannot be avoided, CPV will coordinate with landowners regarding impacts and any necessary mitigation. Some gravel pits have been observed in the Project Area during site visits; however, they are relatively few and minor in size and may not be commercially active. As noted, review of the available literature has not identified any geologic hazards, such as seismic activity, soil liquefaction, and subsidence, likely to affect the Project.

Impacts on groundwater resources within the Project Area are anticipated to be minimal. It is probable that O&M water requirements will be satisfied with a single domestic-sized water well. Based on the small amount of increased impervious surface area that will be created by Project components relative to the separation of these components and the size of the entire Project Area, the Project will likely have minimal impacts on regional groundwater recharge. In isolated areas where the groundwater table is locally elevated, Project construction activities such as excavation and construction of foundations may encounter groundwater. The construction of turbine foundations may therefore affect shallow groundwater flow patterns; however, such impacts will likely be minor and highly localized, with the groundwater resuming its normal course of flow downgradient of the foundation. If dewatering of excavations is necessary, water will be discharged to the surrounding surface, allowing it to infiltrate back into the ground to minimize potential impacts. In addition, each turbine will be located a minimal distance of 1,400 ft from existing occupied residences, thereby minimizing the risk of impacts on private wells in the area, which are assumed to be located in proximity to the occupied residences they serve. Construction of the turbine foundations is not likely to require subsurface blasting; therefore, disturbances to groundwater flow from newly fractured bedrock are not anticipated.

7.12.3 Mitigative Measures

Wind turbines and other Project components will be sited to avoid active sand and gravel extraction operations identified within the Project Area. Where such resources cannot be avoided, CPV will coordinate with landowners regarding impacts and any necessary mitigation. No other mitigation is anticipated to be necessary.

Wind turbine locations are not likely to affect the use of existing water wells because the turbines will not be sited within 1,400 ft of occupied residences. In the event that subsurface blasting is required, a blasting plan will be developed and implemented to keep the impacts localized and fracture the least amount of bedrock necessary for construction. Any dewatering required during construction will be discharged to the surrounding surface, thereby allowing it to infiltrate back into the ground to minimize potential impacts.

7.13 Surface Water and Floodplain Resources

7.13.1 Description of Resources

Surface water and floodplain resources were identified for the Project Area using FEMA Flood Insurance Rate Maps (FIRM), USGS topographic maps, National Land Cover Dataset (NLCD), USFWS National Wetlands Inventory (NWI) data, and the National Hydrography Dataset. According to NLCD data, open water accounts for 1,417 acres, or 8 percent of the entire Project Area. NWI and National Hydrography Dataset waters are depicted on Figure 15. Situated in the West Missouri Coteau Watershed, the Project Area is located in the Rolling Soft Shale Plain of the Northern Great Plains Spring Wheat Region (USDA 2006). The topography in the region contains nearly level plains that include "prairie potholes" and small glacial lakes. The elevation ranges from 1,650 ft in the east to approximately 3,600 ft in the west (USDA 2006).

The extent of floodplains in the vicinity of the Project Area is unknown. McIntosh County has not been mapped for floodplains. However, the North Dakota State Water Commission acknowledged in a letter dated February 17, 2010 that the Project Area is not located in an identified floodplain and believes the Project will not affect an identified floodplain (see Section 10.11.10).

7.13.2 Impacts

Project facilities will be designed to avoid impacts on surface water resources to the extent practicable. Wind turbines will be built on uplands to avoid surface water resources in the lower elevations to the extent practicable. However, Project facilities, such as underground electrical collector lines, access roads, turbine pads, and the O&M building, will impact land and, therefore, potentially impact surface water runoff within the Project Area. These impacts are expected to be minimal.

The North Dakota State Water Commission reports that no identified floodplains are located in the Project Area (see Section 10.11.10). The Project will be designed to avoid flooding areas and wetlands and waterbodies to the extent practicable. Therefore, it is unlikely that the Project will impact floodplain resources.

7.13.3 Mitigative Measures

Runoff from the upper portions of watersheds adjacent to access roads will be allowed to flow unrestricted to the lower portion of the watershed. A Notice of Intent (NOI) to obtain coverage under the NPDES general permit for storm water discharges associated with construction activity will be submitted to the North Dakota Department of Health (NDDOH) prior to construction of the Project.

7.14 Wetlands

7.14.1 Description of Resources

The Project is located within the prairie pothole region. Prairie potholes are glacially formed water-holding depressions. These depressions provide ideal habitat for waterfowl and other migratory and resident wildlife. Wetlands also perform important hydrologic (flood attenuation and groundwater recharge) and water quality (sediment attenuation and nutrient removal) functions.

Desktop wetland analysis methods were used to identify wetlands and waterbodies within the Project Area. The desktop analysis included an assessment of data from the NWI and information from WPA, NRCS, Wetland Reserve Program (WRP) easements, and North Dakota geographic information system (GIS).

The desktop wetland analysis identified 1,067 acres or 6 percent of the Project Area classified as NWI wetlands (Figure 15). Additionally, the desktop wetland analysis identified 8,728 acres of property or 50 percent of the Project Area in USFWS wetland easements (Figure 10). Actual wetland acreage within these easements is substantially less. In many locations, the NWI wetlands and USFWS wetland easements overlap. NLCD data identified 11,041 acres or 63.5 percent of the Project Area as having partially hydric soils and 651 acres or approximately 4 percent of the Project Area as having hydric soils. Soils are one of the parameters considered in addition to hydrology and vegetation when identifying wetlands.

An on-site wetland delineation will be performed in the spring of 2010 within the construction area footprint of the proposed Project layout. The delineation will be performed using the methods described in the 1987 United States Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory 1987), the Great Plains Regional Supplement to the 1987 Manual (USACE 2008). These methods incorporate a three-parameter approach using vegetation, soils, and hydrology to identify the presence of freshwater wetland. The extent of relatively permanent waters (RPWs), other than wetlands, will be determined by applying the USACE definition of Ordinary High Water Mark (OHWM) and methods for jurisdictional determinations as detailed in the USACE Jurisdiction Determination Form Instructional Guidebook (Corps JD Guidebook) revised in 2007, including the December 2, 2008 USACE/USEPA revised Rapanos guidance.

7.14.2 Impacts

Wetland impacts as a result of construction and operation of the Project are yet to be determined. Impacts will be assessed once the on-site wetland field delineation is completed. The finalized turbine layout will take advantage of higher elevations and avoid low-lying areas which are more

likely to contain wetland areas. Final turbine placement prior to construction will be designed to ensure that the majority of wetland sites are left intact. CPV plans to avoid direct impacts within USFWS wetland easements, thereby avoiding the need for a USFWS compatibility analysis and issuance of a Special Use (temporary impact) or Right-of-Way Permit (permanent impact).

Wetland Permitting

Wetlands with "jurisdictional status" are waters of the United States as defined by Section 404 of the Clean Water Act (CWA). Jurisdictional areas covered under Section 404 are regulated by the USACE and the USEPA. Several classes of waterbodies are subject to Section 404, including traditional navigable waters (TNWs), non-navigable tributaries of TNWs that are RPW, and wetlands that directly abut RPWs (USACE 2007).

The USEPA and the USACE are required to assert jurisdiction over certain types of other waters based on a fact-specific analysis as to whether the water has a significant nexus with a TNW (USACE 2007). These types of waters include:

- Non-navigable tributaries that are not relatively permanent waters (non-RPWs), but have a surface connection to TNWs.
- Wetlands adjacent to RPWs or non-RPWs, and separated by a natural berm, dike, or similar structure.
- As defined by the USACE, a wetland is adjacent when it is "bordering, contiguous, or neighboring," to other Waters of the United States, but not directly "touching" or abutting the waters of United States (USACE 2007).

The USACE does not presently assert jurisdiction over the following features:

- Drainage swales or erosional features (i.e., gullies, small washes with small volumes and infrequent flow).
- Ditches (including roadside ditches) excavated wholly in and draining only uplands, and that are not RPWs.

In the absence of adjacent or abutting wetlands, lateral jurisdiction extends to the OHWM. The definition of the OHWM is "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (Code of Federal Regulations (CFR) 2002; USACE 2005, 2007).

The OHWM is also used in the identification of the upstream limits of jurisdiction for tributary waters. Federal jurisdiction generally extends upstream banks and upstream within a tributary to the point where the OHWM is no longer discernible. Additionally, non-RPW channels are considered jurisdictional if an OHWM is discernable. Thus, jurisdictional tributaries range from substantial rivers with definite OHWMs to channels that are usually dry, and may have faint or ill-defined OHWMs, provided there is an eventual surface connection with a TNW (USACE 2005).

North Dakota has been granted authority in Section 404 permit decisions through State Water Quality Certifications (CWA, Section 401). Under the 401 Certification, the NDDOH has prohibited work that will have impacts in classified waters (i.e., certain lakes) under the USACE Nationwide Permit 12 (NDDOH 2007). In accordance with NDCC 43-36-23, hydric soils will be classified by a certified North Dakota soil classifier following wetland delineations as defined in NDCC 43-36-01.

7.14.3 Mitigative Measures

Wetlands will be avoided to the extent practicable during construction and operation of the Project and a pre-construction inventory of existing wetlands will be conducted and filed with the PSC and applicable agencies prior to construction. Prior Project authorization under a Section 404 USACE Nationwide Permit (NWP) will be obtained if impacts on CWA jurisdictional waters are unavoidable and less than 0.5 acre. Permanent impacts on jurisdictional waters will be mitigated according to USACE requirements.

CPV plans to avoid direct impacts on wetlands within USFWS wetland easements. CPV intends to avoid impacts on wetlands under wetland easements in the Project Area thereby avoiding the need for a USFWS permit. If boring for underground collection is required beneath wetlands within USFWS wetland easements, CPV will give USFWS prior notice. If impacts on these areas cannot be avoided, the USFWS will be consulted regarding permits or letters of authorization that may be necessary. If required, mitigation will be performed according to USFWS recommendations. The USFWS may require a compatibility assessment for any direct wetland impacts that occur on easement land.

If applicable, NWP specific General and/or Regional Conditions prescribed for projects in North Dakota as set forth by the USACE and other applicable BMPs will be used during construction and operation of the Project to protect topsoil, minimize soil erosion and protect adjacent wetland resources from direct and indirect impacts. Practices may include containing excavated material, use of silt fences, protecting exposed soil, stabilizing restored material, and re-vegetating disturbed areas with native species.

7.15 Vegetation

7.15.1 Description of Resources

The Project encompasses land that is a mix of native prairie, grassland, pasture, and cropland (hay, corn, soybean, barley, and sunflower). Plant communities within the Project Area are dominated by large tracts of native and historically disturbed prairie with equal amounts of cultivated cropland and hay land. Native prairie consist primarily of mixed-grass prairie dominated by components of the short and tall-grass prairies that may include the species big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*), and green needlegrass (*Stipa viridula*), with prairie cordgrass (*Spartina pectinata*) and northern reedgrass (*Calamagrostis stricta*) near wetlands. Common forbs found in the mixed grass prairie communities include western yarrow (*Achillea millefolium*), pussytoes (*Antennaria* spp.), fringed sagewort (*Artemisia frigida*), milk vetch (*Astragalus* spp.) and purple avens (*Geum rivale*). Prairies provide valuable habitat to a wide variety of

upland bird species and prairie potholes provide critical nesting and brooding habitat to many species of waterfowl.

Cropland and pasture are managed for the production of livestock forage and cereal crops. Management may include fertilization, weed and brush control by pesticide application, fallow, and reseeding. Species composition often includes mixtures of introduced grasses, mixes of grasses and legumes, small grain hay or monocultures of legumes such as alfalfa or clover. Croplands are planted in the spring and may include wheat, barley, sunflower or corn with rotations to hayland crops in cycles. Cropped species are not static and tilled areas will fluctuate with market demands and farm-specific operational requirements.

Native prairies serve as a vital ecological resource by improving water quality, providing erosion control, and supporting a diverse population of plants and animals. However, due to the native prairies' fertile soils and predominantly flat topography, large portions of the native prairie have been converted to agricultural lands. This widespread loss of native prairie makes this an ecosystem of conservation concern and one of the most endangered ecosystems in North America (Samson et al. 1998).

Native prairies serve as vital habitat for the Dakota skipper (*Hesperia dacotae*), a species of butterfly that is currently classified as a federal candidate species (see Section 7.17.1). Native prairies are also critical habitat used by prairie grouse (e.g., sharp-tailed grouse, greater prairie-chicken) for lekking, nesting, brood rearing, and wintering. Grouse lek habitat is classified as open, short grass vegetation with minimal amounts of agriculture. Development in grouse lekking habitat could result in direct habitat loss, habitat loss through avoidance, predator facilitation, and construction-related disturbance. Most prairie grouse are considered gamebirds and are often managed locally by state fish and game agencies for hunting purposes.

CPV has conducted a native prairie survey for the Project Area (see Appendix C). At the time of the survey (July 27 – August 14, 2009), a total of 8,520 acres (50 percent of Project Area) were classified as native prairie and 1,662 acres (10 percent of Project Area) were classified as tame grasslands (Table 7-1; Tetra Tech 2009c). An additional 40 percent were either active crops (corn, alfalfa, soybeans) or grazing pastures for cattle. The largest contiguous areas of native prairie were found in the northwestern region of the Project Area (Tetra Tech 2009c). None of the plant species identified are species listed by the state of North Dakota or federally protected as endangered, threatened or species of concern. Three species listed by the state of North Dakota as being noxious weeds were found in the native and tame grasslands: absinthe wormwood (*Artemisia abisinthium*), Canada thistle (*Cirsium arvense*), and leafy spurge (*Euphorbia esula*).

7.15.2 Impacts

The Project Area contains native prairie. Within the Project Area, potential impacts on plant communities due to construction activities include proposed turbine locations, collector and transmission line routes, crane paths, laydown areas and batch plant, O&M building, and access roads. Permanent components will result in an estimated loss of 36 acres of native vegetation (Figure 10). Construction activities like the installation of a proposed buried collector system and laydown area will result in some temporary effects to native and non-native grasslands. The spread

of noxious weeds during construction is an additional potential impact considered in this application.

7.15.3 Mitigative Measures

In terms of mitigative measures, CPV will:

- Reseed disturbed areas with native material following completion of construction activities;
- Develop a management plan to prevent the spread of noxious weeds throughout the Project or adjacent areas during construction and ongoing operations, in accordance with state and county regulations;
- Work closely with the USFWS and North Dakota Game and Fish Department (NDGFD) during micrositing to minimize impacts on vegetation within the Project Area; and
- Avoid impacts on USFWS WPAs and work with the USFWS to avoid or minimize impacts on wetlands and native prairie within USFWS easements.

CPV will use BMPs during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, stabilizing restored material, and re-seeding rangelands with native species.

7.16 Wildlife

7.16.1 Description of Resources

Information on the existing wildlife in the Project Area was obtained from a variety of sources, including observations during site visits, communication with local residents and information from the NDGFD, North Dakota Parks and Recreation Department (NDPRD), North Dakota Natural Heritage Inventory (NDNHI), University of North Dakota (UND) Environment-Natural Resources Extension Office, and USFWS.

Wildlife within the Project Area consists of birds, mammals, fish, reptiles, amphibians, and insects, both resident and migratory, which utilize the site habitat for forage, migratory stopover, breeding and/or shelter. Species present in the Project vicinity are associated with agricultural fields, pasture grasslands, and wetland areas. Common mammals in the Project vicinity include raccoon (*Procyon lotor*), mink (*Mustela vison*), striped skunk (*Mephitis mephitis*), least weasel (*Mustela nivalis*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), badger (*Taxidea taxus*), porcupine (*Erethizon dorsatum*), and eastern cottontail (*Sylvigagus floridanus*).

Avian Species

North Dakota has 365 documented bird species (Faanes and Stewart 1982) and is situated within the Central Flyway, one of the main bird migratory routes (USFWS 2008a). A fall avian survey was conducted for the Project in order to quantify local avian use within the area and to identify potential avian impacts associated with building and/or operating the proposed facility (Tetra Tech 2009a; Appendix C). Weekly surveys were performed in the Project Area and in adjacent additional land subject to easement agreements between landowners and CPV between August 11 and October 31, 2009. Fixed point count surveys (800-m radius) were conducted at 7 points

distributed throughout the study area. CPV has commenced spring avian point counts at the same locations.

Waterfowl, Waterbirds, and Cranes

Several waterfowl and waterbird species, such as the Canada goose (*Branta canadensis*), snow goose (*Chen caerulescens*), and American white pelican (*Pelecanus erythrorhynchos*) had high encounter rates. Encounter rate is the frequency with which a species flies at heights consistent with the anticipated rotor swept area (RSA); encounter rates greater than 10 birds flying within the RSA per 20 minute (min) (as is the case for these species; Appendix C) suggests the potential for negative turbine interactions. Snow geese and Canada geese mortality has been documented at other wind energy facilities, but the overall numbers of fatalities are very low (Erickson et al. 2004; Anderson et al. 2005; Jain et al. 2007). The combination of the high encounter rate and prior evidence of negative turbine interactions suggest that some fatalities of Canada and snow geese could occur at the Project. If fatalities do occur, they are not expected to have population-level impacts as local breeding population of Canada geese (population estimate ~600,000) and regional migratory populations for Canada and snow geese are quite large (population estimate ~2,000,000) and stable (Sauer et al. 2008; USFWS 2009a). Waterbirds were also ranked high in mean use at the Project, with American coot (*Fulica americana*) and American white pelican ranking the highest. American coot mortality has been recorded at other wind energy facilities but in low numbers (Johnson et al. 2002; Anderson et al. 2005; Kerlinger et al. 2006). Given the high numbers of coots using the area, some fatalities could occur at the Project. If fatalities of American coots do occur, they are not expected to have impacts on the local population as the North Dakota populations currently are increasing slightly (Sauer et al. 2008). Mortality of American white pelicans has not been reported at a wind farm. However, the encounter rates suggest the potential exists for negative interactions for this species. American white pelicans are known to breed in North Dakota (Knopf and Evans 2004) and the large breeding population in North Dakota is showing a slight increase (Sauer et al. 2008). As a result, if any mortality were to occur, it is unlikely to have any population-level impacts.

Sandhill cranes (*Grus canadensis*) had the second highest encounter rate of all species observed during the fall 2009 survey. All of the sandhill cranes were observed outside of the Project Area boundary; however, the observed flight direction suggested that the cranes had flown through the Project Area prior to observation. All observations were made on one day (October 31, 2009) at the end of the survey period. No sandhill crane fatality has been reported at wind energy facilities. Sandhill cranes tend to migrate at heights between 150 to 760 m (Tacha et al. 1992) putting migratory individuals above RSA height; however, the flight height profile of the cranes observed suggests that these birds had either recently taken off from a nearby location, or were searching for a place to land. Theoretically, sandhill cranes are most at risk of collisions with turbines when individuals are either taking off from the ground or coming in to land within the Project Area or the surrounding area; they may also be at risk during weather events that reduce visibility. The central region of the North American population of sandhill cranes is very large (~650,000 individuals according to the International Crane Foundation; http://www.savingcranes.org/sandhillcrane.html) and appears to be stable (Sauer et al. 2008). As a result, in the unlikely event of a facility-related fatality, it is unlikely to have population-level impacts.

Raptors

Most raptor species observed were seen infrequently or exhibited behaviors that should not put them at high risk of turbine collisions, indicating that negative turbine-related impacts are unlikely. Northern harriers (*Circus cyaneus*) and red-tailed hawks (*Buteo jamaicensis*) were the most commonly observed raptor species during avian surveys. Both species have been reported as fatalities at existing wind farms (Johnson et al. 2002; Young et al. 2003; Erickson et al. 2004; Jain 2005); however, their observed flight behavior in the Project Area suggests that the probability of turbine-related fatalities is low. A list of other raptor species can be found in Appendix C.

Listed and Sensitive Species

No federal threatened or endangered species have been observed in the Project Area. During avian surveys, three bald eagles were observed flying at 400 m (i.e., above the RSA) outside of the Project Area boundary on August 22, 2009. Due to the observed flight direction, it is possible the eagles passed through the Project Area prior to the observation. Overall, due to their low use of the Project Area during fall, negative turbine-related impacts are unlikely during this season. In addition, no bald eagle fatalities have been reported during post-construction mortality monitoring at a wind farm site, supporting the assessment that negative turbine-related impacts are unlikely.

State-listed species observed during avian surveys or as incidental observations included 10 Level I and 7 Level II Species of Conservation Priority (Appendix C). Of these state-listed species, Franklin's gull (*Leucocephalus pipixcan*), black tern (*Chlidonias niger*), American white pelican, canvasback (*Aythya valisineria*), northern pintail (*Anas acuta*), northern harrier, Swainson's hawk (*Buteo swainsoni*), ferruginous hawk (*Buteo regalis*), and prairie falcon (*Falco mexicanus*) were observed flying at the height of the anticipated RSA. However, most had very low encounter rates, mostly due to the low overall numbers observed; these low encounter rates suggest a low probability of negative interactions with turbines.

Bats

Based on a desktop study (Tetra Tech 2009b) of the 46 bat species in the United States, 10 occur in North Dakota (ASM 2007); three of these are listed by the NDGFD as sensitive species (Hagen et al. 2005): western small-footed myotis (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), and long-legged myotis (*Myotis volans*). None of the sensitive species are likely to occur in the Project Area. Six bat species are likely to occur: little brown myotis (*Myotis lucifugus*), northern myotis (*Myotis septentrionalis*), silver-haired bat (*Lasionycteris noctivagans*), big brown bat (*Eptesicus fuscus*), red bat (*Lasiurus borealis*), and hoary bat (*Lasiurus cinereu*) (Swier 2003; ASM 2007; Lacki et al. 2007; NatureServe 2008; WBWG 2009). When viewed on a regional scale, the Project Area contains less suitable bat habitat than the surrounding landscape, suggesting a low likelihood of occurrence for bat species across the Project Area (Appendix C).

7.16.2 Impacts

Activities such as road construction can destroy or disrupt wildlife habitat and allow for the introduction of unwanted plant species. In areas where disturbance is significant and natural regeneration of onsite plant propagules will not occur, the temporary loss of habitat may be

mitigated by reseeding of the affected areas with native prairie plant species. Displaced wildlife will likely relocate to nearby unaffected areas within the Project Area.

In addition to mortality associated with wind farms, concerns have been raised that some bird species may avoid areas near turbines after the wind farm is in operation (Drewitt and Langston 2006). For example, at the Buffalo Ridge wind energy facility near Lake Benton in Minnesota, densities of male songbirds were significantly lower in CRP grasslands containing turbines than in CRP grasslands without turbines (Leddy et al. 1999). Reduced abundance of grassland songbirds was found within 50 m of a turbine pad for a wind farm in Washington and Oregon, but the investigators attributed displacement to the direct loss of habitat or reduced habitat quality and not the presence of the turbines (Erickson et al. 2004). However, no studies have addressed whether or not these avoidance effects are temporary (i.e., the birds may habituate to the presence of turbines over time) or permanent.

7.16.3 Mitigative Measures

In terms of mitigative measures, CPV will:

- Minimize permanent impacts on wetlands during design and construction of turbines and associated infrastructure. This will help minimize wildlife impacts (e.g., waterfowl, waterbirds, bats);
- Minimize disturbance of native prairie during design and construction of turbines and associated infrastructure;
- Protect existing trees and shrubs where practicable. If impacts are unavoidable, CPV will replant trees and shrubs unless directed otherwise by the landowner;
- Re-seed non-cropland and pasture areas with a native seeding mix as recommended by USFWS and NRCS;
- Control noxious weeds in the immediate vicinity of the turbines, access roads, and associated facilities, immediately after construction and periodically for the life of the Project;
- Bury the electrical collection system connecting the turbines to the Project substation underground, if site conditions are favorable;
- Implement an Avian and Bat Protection Plan that will be developed with the USFWS and TVA;
- Set back Project wind turbines, substations, and buildings at least 0.25 mi from USFWS WPAs;
- Minimize disturbance of active nests of breeding birds (including raptors) found during Project construction; and
- Conduct pre-construction avian monitoring at the site (e.g., spring avian point counts). Pre-construction avian monitoring protocols are contained in Appendix F.

CPV has conducted environmental studies of the Project Area to aid in the placement of turbines, roads, and associated facilities to avoid or minimize impacts on wildlife and habitat. Also, the Project is coordinating with USFWS and NDGFD regarding avian monitoring and minimization of impacts

on WPAs and other areas. Spring avian use surveys are being conducted prior to Project construction to better document the use of the Project Area and surrounding areas. This may assist in identifying sites with elevated potential for avian/turbine interactions.

7.17 Rare and Unique Natural Resources

7.17.1 Description of Resources

No federal threatened and endangered species have been detected at the Project to date, and in the unlikely event that they do occur, potential impacts will be minimized by proposed avoidance and minimization measures. The Endangered Species Act (ESA) requires the protection of species that are federally listed as threatened or endangered. Significant changes to the habitats of these species, or projects that have the potential to result in "take," would require special permitting from the USFWS. According to the USFWS (2008b), of the federally listed species known to occur within North Dakota, only the whooping crane, piping plover, and gray wolf are listed in McIntosh County.

Whooping cranes (*Grus americana*), a regular spring and fall migrant in North Dakota, were first federally listed as threatened in 1967 and federally listed as endangered in 1970 (Canadian Wildlife Service and USFWS 2007). The primary threats to this species include loss of roosting and foraging habitat and collisions with power lines and fences. In North Dakota, whooping cranes have the potential to occur anywhere suitable feeding and roosting habitat is found; however, 94 percent of all documented whooping crane occurrences have been within a 200-mi corridor adjacent to the Missouri River (Austin and Richert 2001). The Project is located on the eastern edge of the whooping crane migration corridor. While suitable habitat is present at the Project, the likelihood of a whooping crane using the Project Area is low mostly due to the Project's location to the whooping crane's migratory corridor and better habitat located in the surrounding region (Tetra Tech 2009d). The whooping crane likelihood of occurrence report is included in Appendix C. The USFWS is working with the American Wind Energy Association and a group of wind developers, including CPV, to develop a bi-regional Habitat Conservation Plan.

The piping plover (*Charadrius melodus*) is a small, migratory member of the shorebird family. Piping plovers found in the northern Great Plains prefer habitat types that include mixosaline to hypersaline wetlands, rivers, reservoirs, and inland lakes that have beaches, sandbars, shoreline, and flats (USFWS 2002a). The piping plover is listed as a federally threatened species and a Level II Species of Conservation Priority in North Dakota, which indicates a moderate to high conservation priority (Hagen et al. 2005). The Project is located within the range of the piping plover and this species has been recorded in McIntosh County at nearby Salt Lake (Designated Critical Habitat by USFWS). However, no suitable piping plover breeding habitat exists within the Project Area.

Gray wolves (*Canis lupus*) became nearly extinct in the conterminous United States in the early part of the twentieth century. By December 2006, recovery programs had established 1,243 wolves in the Yellowstone area and the northern Rocky Mountains of Montana, Idaho, and Wyoming. The wolf's comeback nationwide is due to its listing under the ESA, resulting in increased scientific research and protection from unregulated killing, along with reintroduction and management programs and education efforts that increased public understanding of wolf biology and behavior. The Project is located in the gray wolf's historic range; however, the current range is far to the north in the

northeast corner of the state and Canada, and the Project does not fall within the boundaries of any recovery programs. The most recent recorded sighting in McIntosh County occurred in 1990 (Licht and Fritts, no date). In the unlikely event that a wolf occurs on the Project Area, construction activities will not affect wolf survival.

The bald eagle was detected during fall surveys and is federally protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act. The bald eagle is listed by the state of North Dakota as a Level II Species of Conservation Priority, which indicates a moderate to high conservation priority. This species is a permanent resident in the Dakotas and typically resides near large bodies of open water such as lakes, marshes, and rivers with adequate prey and tall trees for nesting and roosting. Bald eagles breed and over-winter in the Dakotas primarily along the Missouri River and other large rivers. Bald eagles have been documented to nest in North Dakota in western Burleigh and southern McLean Counties, along the Missouri River (Gomes no date). For breeding, they build large nests in tall trees or other sturdy structures, and are most often found in forested habitats close to water (Gomes no date). While bald eagles have been observed near the Project Area, they are unlikely to be nesting on or near the site due to the lack of suitable trees.

Native prairies serve as vital habitat for the Dakota skipper, a federal candidate species. The Dakota skipper is classified as a candidate species because, although its historic range once consisted of vast unbroken native prairies in north-central United States and south-central Canada, its current range is now limited to scattered remnants of high quality native prairies in Minnesota, North and South Dakota, and southern Manitoba (USFWS 2002b). The Dakota skipper population has declined due to sensitivity to disturbances, such as grazing and fire, and the loss of native prairie habitat. The Dakota skipper's classification as a federal candidate species does not entitle it to legal protection under the ESA; however, if a candidate species becomes listed as threatened or endangered, then protection for that species becomes mandated under the ESA. Immediately upon listing, any Projects that impact the Dakota skipper are not "grandfathered" or exempt from providing protection. The USFWS has indicated that the Dakota skipper has not been reported from McIntosh County (http://www.fws.gov/northdakotafieldoffice/county_list.htm); the Dakota skipper has been recorded in 16 counties in North Dakota, the closest being Stutsman County (approximately 30 mi north from its nearest point to McIntosh County). There is no Dakota skipper designated critical habitat in the county. However, of the area classified as native prairie within the Project Area during the prairie survey (Section 7.15), 52 percent (4,505 acres; 26 percent of the Project) was classified as either good or excellent potential habitat for the Dakota skipper based on the presence of key plant species (e.g., bluestem [*Andropogon* spp.], coneflower [*Echinacea* spp.], camas [*Zygadenus* spp.]; Tetra Tech 2009c). The largest portion of continuous prairie habitat classified as excellent for the Dakota skipper is located in the northwest portion of the Project Area (Tetra Tech 2009c).

7.17.2 Impacts

With respect to the whooping crane, the likelihood of occurrence is low due to the Project's location on the edge of the whooping crane migration corridor and the availability of suitable roosting and foraging habitat on the landscape. The primary threats to this species include loss of roosting and foraging habitat; indirect effects, such as avoidance, are undocumented.

It is unlikely that the Project will have any affect on the piping plover because there is no Designated Critical Habitat nor any suitable breeding habitat within the Project Area. Additionally, CPV has committed to a 0.5-mi setback of all Project facilities from the Critical Habitat southeast of the Project Area. The bald eagle, protected under the BGEPA, is known to use the area in low numbers, but bald eagle breeding activity will not likely be affected by this proposed action. It is unlikely that the Project will have any affect on the gray wolf because Project activities will not negatively affect wolf survival. The USFWS does not list the Dakota skipper as occurring in McIntosh County, nor is there any designated critical habitat in the county; therefore, it is unlikely that the Project will have a significant affect on that candidate species.

7.17.3 Mitigative Measures

In terms of mitigative measures for all of these federally listed and candidate species, CPV will:

- Re-seed disturbed areas with native seed mix;
- Minimize the construction footprint;
- Bury the electrical collection system connecting the turbines to the Project substation underground, if site conditions are favorable;
- Maintain a minimum of 0.5-mi setback from piping plover Designated Critical Habitat for Project facilities;
- Establish a 0.25-mi setback from USFWS WPAs for Project wind turbines, substations, and buildings;
- Implement an Avian and Bat Protection Plan that will be developed with the USFWS and TVA;
- Minimize impacts during preconstruction to sensitive areas such as wetlands to the extent possible;
- Prepare a manual in accordance with the BMPs prior to construction, which will then be provided to construction personnel;
- Train construction personnel on all BMPs; and
- Implement speed limits on Project access roads.

7.18 Summary of Impacts

Table 7-5 summarizes the resources that will be impacted as a result of the Project and the appropriate mitigation.

Table 7-5. Summary of Impacts and Mitigation

Resource	Impact	Mitigation
Socioeconomics	Overall beneficial due to increased tax base and infusion of wages, payments to landowners, and expenditures from Project construction and operations. Negative impacts are minor and limited to removal of land from agricultural use due to siting of Project components.	Net impacts will be positive. Landowner lease payments are expected to offset potential financial losses from the removal of land for agricultural production and substantially increase landowner income as a result of Project operation.
Land Use	Land use within the Project Area will largely remain unchanged. The Project is not expected to have a direct negative impact on property values.	CPV will work closely with the NRCS, USFWS, and landowners to minimize impacts on sensitive areas. To reduce potential impacts on occupied residences, turbines will be installed a minimum of 1,400 ft from occupied residences.
Public Services	There will be a minimal effect on the existing services and infrastructure in and nearby the Project Area.	Construction and operation of the Project will be conducted in accordance with all associated local, state, and federal permits and regulations and industry standards. In order to prevent adverse effects to the existing electrical transmission system, CPV will abide by NERC and MISO regulations and any requirements of their Interconnection Agreement that address electrical service. In its easement agreement with Project landowners, CPV commits to using reasonable efforts to correct any degradation to television reception. Additional mitigation measures will not be required.
Human Health and Safety	No impacts are anticipated.	Turbines will be lighted to comply with FAA requirements. To minimize exposure to EMFs, CPV will setback wind turbines from all occupied residences, bury collection lines to a depth of approximately 4 ft and fence off and place warning signs around the Project substation. CPV will also implement a number of security measures to reduce the chances of physical property damage or personal injury.
Shadow Flicker	Based on distance from turbines to occupied residences and the blade pass frequency of the turbines under consideration, no negative health effects to individuals with photosensitive epilepsy are anticipated.	The 1,400-ft setback of turbines from all occupied residences minimizes potential adverse shadow flicker impacts.
Sound	Potential acoustic impacts associated with Project construction and operation are anticipated to be consistent with similar wind energy projects and no negative health effects are anticipated.	The setback of at least 1,400 ft from all occupied residences minimizes potential adverse sound impacts on noise sensitive areas.
Visual	Visual impacts will occur; however, impacts will be based on subjective human responses.	CPV will work with landowners and agencies to site turbines. Existing infrastructure will be used wherever possible.
Cultural and Archaeological	CPV will avoid the one recorded archeological site and small number of other historic and architectural resources located within the Project Area; no impacts on these resources are anticipated.	CPV will continue consultations with SHPO under Section 106 of the NHPA concerning possible Project impacts on cultural resources. Mitigative measures may include: avoidance of ponds, stream drainages, mapped historic structures, marked cemeteries, and recorded archaeological sites; setbacks from extant roads and occupied buildings; and development of an *Unanticipated Discoveries Plan*.
Recreational Resources	The Project will not result in the removal or deterioration in functional value of nearby recreational facilities. Impacts will be limited to indirect, visual effects.	Wind turbines, substations and O&M buildings will be sited at least 0.25 mi from nearby WPAs in order to mitigate direct, physical impacts on recreational resources.
Land-based Economies	The Project will not have a significant impact on grazing land or woodlands. Construction of Project facilities will result in minimal removal of land from agricultural production for the life of the Project.	Landowners will be consulted to minimize impacts on prime farmland and other productive farmland areas. Once the Project layout has been finalized and the extent of impacts from construction and operation is known, additional mitigative measures, such as lease payments to landowners, will be implemented.
Soils	Impacts on soils will consist primarily of removal of areas from agricultural production by occupancy of Project components. The potential for soil loss due to erosion or impacts on hydric soils, such as compaction, is low.	CPV will restore disturbed areas to pre-construction conditions. To minimize soil impacts, CPV will implement environmental protection measures and BMPs in accordance with the SWPPP.

Resource	Impact	Mitigation
Geologic and Groundwater Resources	Impacts on geologic and groundwater resources will be minor. Blasting of bedrock is not anticipated to be required. Geologic hazards are unlikely to affect the Project. Minor, localized effects to shallow groundwater flow patterns may occur during Project construction.	If active commercial sand and gravel extraction facilities are present, they will be avoided. In the unlikely event that subsurface blasting is required, a blasting plan will be developed and implemented to keep the impacts localized and fracture the least amount of bedrock possible. Impacts on existing groundwater resources will be minimized by the siting of turbines at least 1,400 ft from existing occupied residences.
Surface Water and Floodplain Resources	The Project will be designed to avoid flooding areas, wetlands, and waterbodies to the extent practicable. The North Dakota State Water Commission reports that no identified floodplains are located in the Project Area. Therefore, it is unlikely that the Project will impact surface water or floodplain resources.	A NOI to obtain coverage under the NPDES general permit for storm water discharges associated with construction activity will be submitted to the NDDOH prior to construction of the Project.
Wetlands	Impacts on wetlands will be assessed once the on-site wetland field delineation is completed. Final turbine placement will be designed to minimize impacts on wetlands and ensure that the majority of wetland sites are left intact. CPV intends to avoid impacts on wetlands under USFWS wetland easements in the Project Area.	Wetlands will be avoided to the extent practicable during construction and operation of the Project. A Section 404 USACE NWP will be obtained if impacts on CWA jurisdictional waters are unavoidable and less than one-half acre. If applicable, NWP specific General and/or Regional Conditions prescribed for projects in North Dakota as set forth by the USACE and other applicable BMPs will be used during construction and operation of the Project. Permanent impacts on jurisdictional waters will be mitigated according to USACE requirements. If impacts on wetland easements cannot be avoided, the USFWS will be consulted regarding permits or letters of authorization that may be necessary.
Vegetation	Potential impacts on plant communities due to construction activities include proposed turbine locations, collector and transmission line routes, and access roads.	CPV will work closely with the USFWS and NDGFD while micrositing facilities to minimize impacts. A variety of additional mitigative measures will be implemented, as discussed in Section 7.15.3, including reseeding disturbed areas with native material following completion of construction activities.
Wildlife	Project construction may destroy or disrupt wildlife habitat. Displaced wildlife will likely relocate to nearby unaffected areas within the Project Area. Potential avian and bat collisions may occur; however, based on the 2009 fall avian survey, avian species with the highest encounter rates and greatest potential for negative turbine interactions are unlikely to experience population-level impacts.	A variety of mitigative measures will be implemented, as discussed in Section 7.16.3. These include implementing an Avian and Bat Protection Plan that will be developed with the USFWS and TVA. Spring avian use surveys will be conducted prior to Project construction to better document the use of the Project Area and surrounding areas. This may assist in identifying sites with elevated potential for avian/turbine interactions.
Rare and Unique Natural Resources	No federal threatened and endangered species have been detected at the Project to date, and in the unlikely event that they do occur, potential impacts will be minimized by proposed avoidance and minimization measures. Federally listed species known to occur in McIntosh County include the whooping crane, piping plover and gray wolf. The likelihood of impacts on each of these species is low, as discussed in Section 7.17.2. The bald eagle, which is protected under the BGEPA, was detected in low numbers during the 2009 fall avian survey; however, bald eagle breeding activity will not likely be affected by this proposed action. The Project will impact native prairie, which serves as vital habitat for the Dakota skipper, a federal candidate species. However, Dakota skipper is not listed by USFWS as a species found in McIntosh County.	CPV has committed to a 0.5 mi setback of all Project facilities from the piping plover Designated Critical Habitat southeast of the Project Area. Additional mitigative measures are detailed in Section 7.17.3, including burying collection lines to reduce collision risk to birds including the whooping crane, piping plover, and bald eagle. In the unlikely event of a gray wolf occurring within the Project area, Project construction activities will not impact wolf survival.

8. PUBLIC COORDINATION

Public coordination and interaction is a key component to Project success. CPV has been actively engaged in the Project community since December 2007, including interactions with private landowners and local agencies and authorities. To date, CPV has engaged the McIntosh County Commissioners, the McIntosh County Zoning Board, the Mayors of Ashley and Lehr, the Ashley Economic Development Coordinator, the Wishek Job Development Authority, the McIntosh County Wind Energy Committee, LLC, and many other McIntosh County Officials. On February 3, 2010, CPV received a letter from the McIntosh County Commissioners indicating that no county permits are required for wind projects in McIntosh County (Appendix E). CPV is committed to keeping key stakeholders, including county officials and participating private landowners, engaged as the Project progresses.

CPV and its representatives have also engaged state and federal agencies to inform them of the Project and identify and address potentially sensitive issues. In addition to key federal stakeholders (e.g., USFWS, USACE, etc.), CPV has notified and requested input from the 21 designated state agencies and officers identified by NDAC 69-06-01-05. Refer to Section 10.11 and Appendix E for comments received from these agencies and officers.

9. IDENTIFICATION OF POTENTIAL PERMITS/APPROVALS

The federal and state permits or approvals that have been identified as potentially required for the construction and operation of the Project are shown in Table 9-1. Permits dependent on the final site layout will be applied for after receiving PSC approval, but prior to construction.

Table 9-1. Potential Permits and Approvals Required for Construction and Operation of the Proposed Facility

Agency	Type of Approval	Status	Need
Federal Approvals			
TVA	National Environmental Policy Act (NEPA) Review	2	NEPA requires federal agencies to integrate environmental values into their decision-making process by considering the environmental impacts of their proposed actions and reasonable alternatives through an Environmental Assessment (EA) or Environmental Impact Statement. TVA is required to perform NEPA review due to their execution of a PPA with CPV for power generated by the Project.
	NHPA Section 106 Consultation	2	NHPA compliance is required as a component of NEPA review. Under Section 106, federal agencies must take into account the effects of their undertakings upon historically-significant districts, sites, buildings, structures, and objects and consult with the SHPO.
	Archeological Resources Protection Act (ARPA), Archeological Investigation Report	3	ARPA protects archeological resources and sites that are located on federal property and Native American tribal lands. If construction or operation of the Project is likely to impact archaeological resources, compliance may be required as a component of NEPA review.
	ESA Section 7 Consultation	2	Section 9 of the ESA prohibits the take of an endangered species. With a federal action, a Section 7 consultation with the USFWS is required under NEPA review by the lead agency.
USFWS	Compatibility Analysis of Disturbed Easements	3	If constructing in wetlands within wetland easements or in WPAs, then compatibility analysis by USFWS is required.
	Right of Way Permit	3	If use is compatible, then a Right of Way Permit may be required for permanent disturbance in wetlands within wetland easements.
	Special Use Permit	3	If use is compatible, then a Special Use Permit is required for temporary disturbance in wetlands within wetland easements.
USACE	CWA, Section 404 Permit (NWP)	3	Permit required for fill in jurisdictional waters of the U.S. Further investigation is required to determine USACE jurisdiction of wetlands within the Project Area.

Agency	Type of Approval	Status	Need
USEPA	Oil Pollution Prevention Regulations (40 CFR 112.5), SPCC Plan	3	Plan is required if aggregate storage capacity of 1,320 gallons of oil on site with the potential to discharge to waters of the U.S.; however, qualified Tier 1 facilities can self-certify SPCC Plan if less than 10,000 gallons is stored aboveground onsite. Assessment of on site oil storage during both construction and operations of the facility.
FAA	Form 7460-1, Notice of Proposed Construction or Alteration	1	Notice and approval are required for structures over 200 ft in height. FAA approval of lighting and marking of turbines is required.
FERC	Federal Power Act, Section 205 rate approval	2	Prior to commissioning of the facility, rates and charges for selling electric energy must be reviewed and authorized by FERC. CPV will apply for market-based rate authorization.
FERC	Federal Power Act, Section 201	2	CPV will file for Exempt Wholesale Generator Status.
State of North Dakota			
PSC	Certificate of Site Compatibility	1	LOI and CSC application required for construction of generation facility over 60 MW in size.
NDDOH, Division of Water Quality	NPDES Permit: General Construction Storm Water	2	NOI required for disturbance of over 1 acre of land for minor projects or greater than 5 acres for major projects. Must prepare a SWPPP.
	Section 401 Water Quality Certification	3	Applicants receiving a Section 404 permit from USACE are required to obtain a Section 401 Water Quality Certification from the state.
NDDOH	Septic Tank and Drainfield Permit	2	Required for installation of septic system at O&M facility.
NDDOT, North Dakota Highway Patrol	Overheight/Overweight Permit	2	Permit required for hauling construction equipment and materials on State Highways.
	Trip Permit/Fuel Permit	3	A trip permit and fuel permit will be required if the trucking company is not currently registered in the state.
NDDOT	Driveway Application and Permit Form SFN 5918 (Rev. 10-2008)	3	Permit required for construction of access roads from State Highways.
	Utility Occupancy Application and Permit Form SFN 7995 (Rev. 11-2008)	3	Permit required for utilities placed within or crossing State Highway rights-of-way.
Local Permits			
No applicable local permits (McIntosh County, townships) have been identified. CPV has entered into a road agreement with McIntosh County.			

* Status Explanation: 1 Applied and/or Decision Pending
2 In Progress or Will Apply Once Certificate is Received
3 Final Layout will Determine Whether Permit/Approval is Needed

10. FACTORS CONSIDERED

The Act lists 11 factors to guide the PSC in the evaluation and designation of the site of the facility.

10.1 Public Health and Welfare, Natural Resources, and the Environment

Research and investigations relating to the effects of the proposed Project on public health and welfare, natural resources, and the environment are discussed in the preceding sections. Section 7.18 provides a summary of these effects and the proposed mitigation measures intended to minimize them.

10.2 Technologies to Minimize Adverse Environmental Effects

In order to minimize adverse environmental effects, CPV will use the most recent technologies available at the Ashley Wind Energy Project. The use of current wind turbine technologies, including the equipment and siting tools, will optimize wind and land resources.

10.3 Potential for Beneficial Uses of Waste Energy

No waste energy will be created by the Project; therefore, this factor is not applicable.

10.4 Unavoidable Adverse Environmental Effects

Unavoidable adverse environmental effects associated with the Project consist primarily of the placement of Project facilities and permanent use of land within the site. Despite the overall size of the Project Area, the turbines and other wind farm infrastructure will occupy only approximately 0.5 percent of this area. According to the proposed Project layout, which is subject to change during micrositing, it is anticipated that the approximate amount of permanent impact will be: approximately 16 acres for the turbines; 55 acres for new gravel access roads; and 3.9 acres for other permanent impacts, such as a substation site, O&M building site, and up to four permanent met towers. Total permanent land disturbance for the Project is expected to be up to 73 acres. An additional 261 acres will be disturbed by temporary impacts such as the underground electrical collection lines, temporary crane paths, temporary batch plant and a centralized laydown area for construction staging. In addition to the physical footprint of the facilities, the Project will also result in a change to the visual character of the site. These impacts will be based on subjective human responses to the alteration in the viewshed.

10.5 Alternatives to the Proposed Site

Alternative renewable energy sources are discussed in Section 2.2. CPV believes that the proposed Project Area is the most viable option due to its energetic wind resources, accessibility to the existing electrical grid, and positive community reception; therefore, alternative project areas were not explicitly considered. CPV is nonetheless committed to maintaining flexibility on the proposed site layout and working closely with landowners and regulatory agencies to examine all feasible alternatives to the site layout.

10.6 Irreversible and Irretrievable Commitment of Natural Resources

Irreversible and irretrievable commitment of natural resources refers to the use of nonrenewable resources that, as a result of their proposed use, will be unavailable to future generations. These commitments are irreversible in the sense that the resources cannot be replaced within a reasonable time frame. They are also irretrievable because they involve a loss in value or utility of the affected resources that cannot be restored. The Project involves very few commitments of natural resources that are irreversible and irretrievable, limited primarily to the construction phase of the Project.

Nonrenewable resources that will be used during the construction of the Project include aggregate resources, concrete, steel, and petroleum fuel. The Project's access roads will consist of aggregate (i.e., gravel), while concrete will be used for the foundations of multiple Project facilities, most notably including turbines. Each turbine will be constructed primarily of steel. Lastly, hydrocarbon fuels will be used during construction by construction and delivery vehicles, as well as construction machinery.

10.7 Direct and Indirect Economic Impacts

Overall, the Project will have a significant net positive impact.

Construction of the Project will not cause additional impacts on the industry of the area. The areas of permanent impact (approximately 73 acres) will be removed from their current use for the lifetime of the Project, primarily resulting in a loss of agricultural land. In general, landowners will be able to continue to use their property for agriculture around turbine locations. Properties with Project facilities will be entitled to compensation, as established by individual easement agreements.

In the long-term, the Project will result in positive impacts on the local economy. Construction and operation of the Project will provide an infusion of money into the local economy through a number of different avenues. The Project will increase the tax base of McIntosh County, improving the local economy. In addition, Project landowners whose land is utilized will receive payments throughout the life of the Project. This will further contribute to strengthening the local economy and its tax base. During construction, local contractors will be used to the extent practicable, resulting in wages and salaries that will directly benefit the regional economy. Wages and salaries paid to non-local contractors will also likely benefit the regional economy through expenditures for supplies, lodging, fuel, and other services. During operation, there may be as many as 12 full-time dedicated personnel on-site to perform O&M services. Local skilled labor will be utilized to the extent practicable to staff these positions. Finally, the construction of the Project may contribute to the development of wind-related businesses such as blade testing facilities and specialized operations and maintenance companies in the area which will further contribute to the economic growth of the region.

10.8 Existing Development Plans of the State, Local Government and Private Entities at or in the Vicinity of the Site

CPV is unaware of any conflicts with existing development plans of state, local government, or private entities at or in the vicinity of the site.

10.9 Effect of Site on Cultural Resources

CPV conducted a Survey for the Project to identify previously reported cultural resources within the Project Area. The Survey identified a small number of previously reported archeological and historic resources. These resources included at least four mapped historic cemeteries, a historic church, a historic school, and one prehistoric archeological site consisting of a series of Native American stone circles. No historic architectural resources or NRHP-listed properties have been recorded in the Project Area. CPV will avoid the previously reported sites; therefore, they will not be affected by construction or operation of the Project.

The small number of reported archeological sites and historic architectural resources in the Project Area reflect the rarity of archeological and architectural surveys. There is, however, potential for previously unreported prehistoric Native American archeological sites and historic Euro-American archeological and architectural resources in the Project Area.

CPV will continue supporting TVA's consultations with SHPO under Section 106 of the NHPA concerning possible Project impacts on cultural resources. Mitigative measures are detailed in Section 7.8.3.

10.10 Effect of Site on Biological Resources

Biological resources that may be affected by the Project include wetlands, native plant communities and wildlife. CPV will seek to avoid or minimize impacts on these resources through additional studies, including field wetland delineations and pre-construction avian surveys, as well as various mitigative measures, as detailed in Sections 7.15.3, 7.16.3, and 7.17.3. CPV will work closely with the USFWS and NDGFD to microsite Project facilities in a manner that minimizes potential impacts on biological resources to the greatest extent practicable.

10.11 Agency Comments

It is CPV's business practice to seek agency input early and often on their development projects. For this Project, CPV met with a number of interested agencies, including the PSC, USFWS, NDGFD, the Department of Commerce, North Dakota Aviation Commission, among others, in advance of this application filing. Additionally, CPV requested input from 33 federal, state, and local agencies and authorities on the development of the proposed Project through a letter posted on January 8, 2010 (Appendix E). A total of 12 agencies provided letter responses to CPV's inquiry letters; two additional agencies responded via telephone call. Agency responses are summarized below. A matrix of these 33 agencies contacted and when their responses were received, along with copies of correspondence, are included in Appendix E. Appendix E also contains a letter from the McIntosh County Commission indicating there are no permitting requirements specific to the County for this Project.

10.11.1 Federal Aviation Administration

The FAA responded to CPV's inquiry in a letter dated February 2, 2010. The FAA's response advised CPV to file a Notice of Proposed Construction or Alteration, to contact FAA technical operations regarding possible impacts on aircraft navigation and communication equipment, and to avoid creating hazardous wildlife attractants in the design, construction, and operation of the

Project. The FAA also requested that CPV include the Ashley Municipal Airport in the Project planning process. As discussed in Section 7.5.3, the FAA issued a "Determination Of No Hazard To Air Navigation" with respect to all turbines on February 24, 2010 (Appendix D).

10.11.2 USDA Farm Service Agency

The USDA FSA responded to CPV's inquiry in a letter dated January 25, 2010. The FSA's responses provided guidelines for potential effects or transactions involving CRP land or FSA Farm Loan Program (FLP) borrowers. For reference, the letter also included FSA-2060 "Application for Partial Release, Subordination, or Consent," FSA Handbook 4-FLP Par. 196 A and B, and Notice FLP-628.

10.11.3 USEPA

In a letter dated February 5, 2010, the USEPA responded to CPV's inquiry. USEPA's letter acknowledged the receipt of the CPV inquiry letter, but stated that the information it presented was insufficient to determine whether any review would be necessitated the agency. The letter indicated that the USEPA would provide additional evaluation if an NEPA EA or Environmental Impact Statement were initiated.

10.11.4 North Dakota State Historical Society

The State Historical Society of North Dakota responded to CPV's inquiry in a letter dated January 13, 2010. The letter identified the "potential for unrecorded and recorded properties in a variety of physiographic settings in the overall study area," and recommended that CPV conduct a Class I Cultural Resources Inventory. The letter indicated that the necessity and extent of follow-up investigations would be determined based on the Class I survey results and, once developed, the Project layout.

10.11.5 North Dakota Parks and Recreation Department

The NDPRD responded to CPV via a letter dated January 29, 2010. The letter stated that the Project will not affect state park lands or Land and Water Conservation Fund recreation projects. The department also provided results of a review of the North Dakota Natural Heritage database, which indicated records for the occurrence of piping plover in a section adjacent to the Project Area. The department recommended that any disturbed areas be revegetated with native species and that CPV conduct pre-construction and post-construction avian and bat monitoring surveys.

10.11.6 North Dakota Office of Attorney General

The North Dakota Office of Attorney General responded via a letter dated January 25, 2010. The letter acknowledged the receipt of CPV's inquiry letter and stated that the office is prohibited from providing legal assistance to private businesses or reviewing private legal matters. No input on the Project was provided.

10.11.7 North Dakota Geological Survey

The NDGS responded to CPV via a letter dated January 12, 2010. The letter stated that no permits are required from the NDGS, and provided a summary of geological information for the Project Area and references for additional information.

10.11.8 North Dakota Department of Health

The NDDOH provided input to CPV in a letter dated January 26, 2010. The NDDOH provided comments regarding fugitive dust emissions during construction, effects to waterbodies, storm water runoff, and noise. The department also provided guidelines for minimizing degradation to waterways during construction.

10.11.9 North Dakota Department of Transportation

CPV received a response from the NDDOT in a letter dated January 21, 2010. The NDDOT informed CPV that the segment of North Dakota Highway 13 between Wishek and Lehr is scheduled for reconstruction during 2011 and 2012, which may temporarily prevent transport of over dimensional loads. The department also stated that additional permits may be needed if the Project crosses a state highway with a power line or if any work needs to be done on a highway right-of-way.

10.11.10 North Dakota State Water Commission

In a letter dated February 17, 2010, the North Dakota State Water Commission provided comments on the Project. The letter stated that the Project is not located in an identified floodplain or near any sole-source aquifers, and advised that all waste material from the Project be disposed of properly and not placed in identified floodway areas.

10.11.11 North Dakota Department of Labor

The North Dakota Department of Labor provided a written response to CPV's inquiry in a letter dated January 13, 2010. The letter stated that the Department of Labor could not identify any concerns and took no position on the Project.

10.11.12 Job Service North Dakota

In a letter dated January 13, 2010, Job Service North Dakota stated that it had no comments regarding the Project and that no applicable permits are required from that office.

10.11.13 Mayor of Ashley

The Mayor of Ashley responded to CPV's letter through a telephone call placed on January 12, 2010. Mayor Donald Kosel expressed that the City of Ashley's only concerns pertaining to the Project are construction traffic on city streets and the potentially insufficient capacity of existing hotels and motels in the city for construction workers. Mayor Kosel indicated that CPV had already initiated consultation with the city to address these issues.

10.11.14 McIntosh County Commissioner

Mr. Ron Meidinger, McIntosh County Commissioner, responded to CPV's letter through a phone call placed on January 27, 2010. Commissioner Meidinger stated that he would request that the county's energy committee draft a letter response to CPV stating that the County Commissioners do not have any particular concerns or comments regarding the Project, but that they will participate in Project planning and help in any manner they can. CPV has not yet received the aforementioned letter. In a separate correspondence, the McIntosh County Commission provided CPV with a letter indicating there are no permitting requirements specific to the County for this Project (Appendix E).

11. QUALIFICATIONS OF CONTRIBUTORS

NAME PROJECT ROLE	EDUCATION AND PROFESSIONAL EXPERIENCE
JOHN HAFNER Manager CPV	John Hafner has been a member of CPV since 2007 and has been directly involved in the Project since its inception. He has been especially active in the northern Midwest and is responsible for projects in North Dakota and Minnesota. John has monitored and participated in multiple MISO task forces and is CPV's representative in the development of a Bi-regional Whooping Crane Habitat Conservation Plan. Previously, John served as an Officer in the United States Navy, leaving as a Lieutenant (O-3). While serving, John was a Reactor Electrical Division Officer aboard USS RONALD REAGAN (CVN-76), where his watch-standing duties included directing the O&M of a Naval nuclear power reactor, steam plant and propulsion system. John also served as the Anti-Submarine Warfare Officer aboard USS COLE (DDG-67) where his watch-standing duties included Officer of the Deck, a senior at-sea watch directing all operations of the ship. John holds a Masters in Engineering Management from Old Dominion University and a Bachelor of Arts from the University of Rochester, dual-majoring in Astrophysics and Religion.
GENER GOTIANGCO Vice President CPV	Gener Gotiangco has been with CPV since 2005 and has 21 years of experience in all phases of thermal and renewable project development, construction, and operations and will have responsibility for operations of the Ashley Wind Energy Project. Gener has been involved in over a dozen thermal power projects (development, construction, or operations) and two operational wind projects (development, construction, and operations). On those projects, Gener has taken direct responsibility for managing 2,400 MW of operating thermal plants, technical and commercial lead on project development and construction activities, and was actively engaged in the development to operations life cycle of two active wind turbine projects. Previously, Gener was employed at PG&E Generating Company where he held positions within the organization's Project Engineering and Development Group. He was actively involved in project engineering, development, acquisition, and operations. Prior to that, Gener was employed by Bechtel Power Corporation where he was involved in the design and construction of numerous thermal power projects in the United States and abroad. Gener holds a Bachelor of Science Degree in Mechanical Engineering from Virginia Polytechnic Institute and State University and has a Professional Engineer's License.
JOHN MURPHY Senior Vice President Construction CPV	John Murphy has 25 years of experience managing the successful installations of power plants throughout the United States and will have overall responsibility for construction of the Ashley Wind Energy Project. John has experience in bidding and negotiating EPC Power Contracts and has negotiated 15 turnkey EPC Contacts throughout his career. John has successfully installed power plants throughout all regions of the United States in both union and non-union environments, and has also installed several facilities throughout Latin America.

NAME PROJECT ROLE	EDUCATION AND PROFESSIONAL EXPERIENCE
	As a Senior Executive for Gemma Power Systems, a national EPC Contractor, John was responsible for profit and loss on the turnkey installation of 10 power projects ranging in size from 50 MW peaking facility to 600 MW combined cycle facility, totaling more than 2,500 MW. All of these projects were completed on time, under budget and went on to operate reliably. John has been responsible for installing the prime movers of every major equipment manufacturer, including ABB, Siemens, Westinghouse, and GE, both aero derivative and frame machines. Throughout his career John has been dedicated to the successful completion of EPC power projects and has performed in the role of every vital position within an EPC contractor organization, starting out with Worley Parsons, as a mechanical field engineer, and subsequently fulfilling the roles of project engineer, construction manager, commissioning manager, project manager, project executive, EPC contract negotiator and most recently as a Senior Executive with Gemma Power Systems, responsible for all project operations. John holds a Bachelor of Science Degree in Mechanical Engineering, from the University of Notre Dame, and a Bachelor of Arts from St. Anselm College.
SEAN FINNERTY Senior Vice President Renewable Development CPV	Sean Finnerty has been a member of CPV since its inception and has taken a variety of leadership roles for the Company including project development, marketing, portfolio acquisitions, and asset management. Currently, Sean is responsible for all aspects of the Company's renewable energies program including operation of CPV Renewable Energy Company and the Ashley Wind Energy Project. He provides strategic direction for the program, overseeing project developers, leading all major commercial negotiations and directing investment recommendations related to renewable energy endeavors. Sean holds an MBA from the Sawyer School of Management at Suffolk University and a BS in Resource Economics from the University of Massachusetts at Amherst.
ROBERT BURKE General Counsel CPV	Robert has over 20 years of experience representing energy companies in the United States and abroad in numerous contexts, including complex project developments, acquisitions, operations, regulatory matters and financings. As General Counsel, Robert oversees the legal representation of the Company, including its compliance program, and participates in the broad spectrum of the Company's project development activities. Previously, Robert was an officer of PPL Corporation, serving as Vice President and Chief Counsel for PPL Global, which was responsible for the development, acquisition and financing of energy resources domestically and throughout Europe and Latin America. Prior to joining PPL, Robert was counsel for Mission Energy and was lead counsel in the development and related financings of electric generation projects in New York and Virginia. Prior to that, Robert was an attorney with Hunton & Williams, LLP, where he represented energy companies before the Federal Energy Regulatory Commission. Robert holds a JD and MA from the University of Virginia, and a BA from Providence College.

NAME PROJECT ROLE	EDUCATION AND PROFESSIONAL EXPERIENCE
MOLLIE SMITH Attorney for Applicants Fredrikson & Byron, P.A.	Mollie Smith assists clients with a variety of energy-related matters, including federal, state, and local permitting for wind energy conversion facilities and transmission facilities in North Dakota and Minnesota, as well as other states. Mollie has been providing legal assistance to CPV with respect to the Ashley Wind Energy Project since mid-2008. Mollie holds a J.D. from the University of Minnesota, a M.A. from Colorado State University, and a B.A. from Northern State University.
ERIKA ROBERTS Project Manager Tetra Tech EC, Inc.	Erika Roberts has over 9 years of experience in the environmental consulting field and works directly with clients, subcontractors, state and federal agencies, and local communities in the preparation of environmental studies and permit application submittals. She leads and directs internal teams in various technical disciplines to support environmental due diligence, critical issues analyses, and permitting efforts. As a Project Manager at Tetra Tech EC, Inc., Erika focuses on supporting wind power development projects; however, she also has experience in a range of areas including power generation facility permitting, audits and due diligence, natural gas transmission and storage, electric transmission and distribution, and pollution prevention programs. Erika has been supporting the Ashley Wind Energy Project since April 2009, providing comprehensive environmental studies and permitting support for CPV. She has consulted for Competitive Power Ventures, Inc. since 2001, managing wind energy environmental work for them under CPV Wind Ventures and then CPV REC since 2005 (involved with approximately 20 wind projects at various stages of development). Erika holds a Bachelor of Arts in Environmental Science from the University of Virginia.
JASON JONES, PH.D. Senior Ecologist Tetra Tech EC, Inc.	Jason Jones is the senior ecologist supporting the Ashley Wind Energy Project and has served as the task lead and senior reviewer of the 2009 Fall Avian Report, native prairie survey, bat and whooping crane likelihood of occurrence reports, and wildlife and avian sections of this application. Jason has been with Tetra Tech for 2 years and has over 17 years experience as a wildlife ecologist, with a focus on avian and bat ecology and natural resource management. Jason holds a Ph.D. in Biology from Queen's University and a B.S. in Biology and Environmental Studies from the University of Victoria. He has published more than 25 peer-reviewed scientific publications and has given dozens of invited seminars and scientific conference presentations on avian and bat ecology.
SCOTT GLAUBITZ, P.E., P.L.S. President B.S.E. Consultants, Inc.	Scott Glaubitz has over 27 years experience in designing and providing construction observation for civil engineering projects. He is licensed as a professional engineer in ten states. Scott has provided engineering assistance to Competitive Power Ventures, Inc. on two power plant projects and approximately 10 wind farm sites. Scott holds a Bachelor of Civil Engineering from the University of Minnesota and is President of B.S.E. Consultants, Inc. located in Melbourne, Florida.

12. REFERENCES

AirNav. 2009a. 6LF – Wishek Municipal Airport. http://www.airnav.com/airport/6L5, retrieved December 22, 2009.

AirNav. 2009b. KASY – Ashley Municipal Airport. http://www.airnav.com/airport/ASY, retrieved December 22, 2009.

Anderson, R., J. Tom, N. Neumann, W.P. Erickson, M.D. Strickland, M. Bourasse, K.J. Bay, and K.J. Sernka. 2005. Avian monitoring and risk assessment at the San Gorgonio Wind Resource Area. Technical report prepared by State Energy Resources Conservation and Development Commission and Western EcoSystems Technology, Inc. for National Renewable Energy Laboratory. Golden, CO.

ASM (American Society of Mammologists). 2007. Mammals of North Dakota. http://www.mammalsociety.org/statelists/ndmammals.html.

Austin, J.E., and A.L. Richert. 2001. A comprehensive review of the observational and site evaluation data of migrant whooping cranes in the United States, 1943-99. U.S. Geological Survey, Northern Prairie Wildlife Research Center, Jamestown, North Dakota, and State Museum, University of Nebraska, Lincoln, Nebraska. 157 pp.

AWEA (American Wind Energy Association). 2009. Wind Energy Potential. http://www.awea.org/faq/wwt_potential.html, retrieved December 28, 2009.

Bluemle, J.P. 1991. The face of North Dakota (Revised Edition). North Dakota Geological Survey, Educational Series 21, Bismarck, North Dakota.

Canadian Wildlife Service and USFWS. 2007. International recovery plan for the whooping crane. Ottawa: Recover of the Nationally Endangered Wildlife (RENEW), and U.S. Fish and Wildlife Service, Albuquerque, NM.

City of Ashley. 2009. City of Ashley, North Dakota. http://www.ashley-nd.com/, retrieved December 28, 2009.

Clayton, Lee. 1962. Glacial Geology of Logan and McIntosh Counties North Dakota. North Dakota Geological Survey, Bulletin 37, Grand Forks North Dakota. Geology and groundwater resources of Burleigh, North Dakota, Part I: Geology. North Dakota Geological Survey, Bulletin 42, Grand Forks, North Dakota. http://swc.state.nd.us/4dlink9/4dcgi/GetContentRecord/PB-268, retrieved December 22, 2009.

Dakota Heartland Champion Community. 2009. Golf Southcentral North Dakota: Our Courses. http://www.golftheheartland.com/our_courses_6.html, retrieved December 30, 2009.

Drewitt, A.L., and R.H.W. Langston. 2006. Assessing the impacts of wind farms on birds. Ibis 148:29-42.

Elliott, D.L., C.G. Holladay, W.R. Barchet, H.P. Foote, W.F. Sandusky. 1986. Wind Energy Resource Atlas of the United States. http://rredc.nrel.gov/wind/pubs/atlas/, retrieved December 28, 2009.

Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual. Department of the Army. Technical Report Y-87-1. U.S. Army Engineers Waterways Experiment Station, Vicksburg, MS. 99 pp plus appendices.

Epilepsy Action. 2008. British Epilepsy Association. http://www.epilepsy.org.uk/info/photo_other.html. Accessed 9/5/08.

Erickson, W.P. 2007. Summary of methods and results for prediction and estimation of impacts and risk. Presented at NWCC Probability of Impact Workshop, 13 November 2007, Golden, CO.

Erickson, W.P., J. Jeffrey, K. Kronner, and K. Bay. 2004. Stateline Wind Project Wildlife Monitoring Final Report, July 2001—December 2003. Technical report peer- reviewed by and submitted to FPL Energy, the Oregon Energy Facility Siting Council, and the Stateline Technical Advisory Committee.

Faanes, C.A. and R.E. Stewart. 1982. Revised checklist of North Dakota birds (Version 16JUL97). The Prairie Naturalist 14(3):81-92. Jamestown, ND: Northern Prairie Wildlife Research Center. Online at: http://www.npwrc.usgs.gov/resource/birds/chnbird/chnbird.htm.

Gomes, S. No date. Hawks, eagles, and falcons of North Dakota. North Dakota Game and Fish Department, Bismarck, ND. Jamestown, ND: Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/birds/hawks/index.htm (Version 16JUL97). Accessed December 28, 2009.

Gregg, Michael L., Amy Bleir, and Fern E Swenson. 2008. The Southern Missouri River Study Unit. Historic Preservation in North Dakota A Statewide Comprehensive Plan. Online: http://www.state.nd.us/hist. Accessed November 2, 2009.

Hagen, S.K., P.T. Isakson, and S.R. Dyke. 2005. North Dakota Comprehensive Wildlife Conservation Strategy. North Dakota Game and Fish Department. Bismarck, ND. 454 pp. Available at: http://www.gf.nd.gov/conservation/cwcs.html

Hoen, B., and R. Wiser, P. Cappers, M. Thayer, and G. Sethi. 2009. The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis. Lawrence Berkeley National Laboratory. December 2009. http://eetd.lbl.gov/ea/ems/reports/lbnl-2829e-ppt.pdf.

Hoeven, John. 2007. Governor Hoeven's Energy Initiatives, North Dakota. Available at: http://governor.nd.gov/init/en-init.htlm. Accessed February 10, 2010.

Jain, A., P. Kerlinger, R. Curry, and L. Slobodnik. 2007. Annual report for the Maple Ridge wind power project post-construction bird and bat fatality study—2006. Prepared by Curry and Kerlinger, LLC for PPM Energy, Horizon Energy, and Technical Advisory Committee for the Maple Ridge Project.

Jain, A.A. 2005. Bird and bat behavior and mortality at a northern Iowa windfarm. Master's thesis. Iowa State University, Ames, IA.

Johnson, G.D., W.P. Erickson, M.D. Strickland, M.F. Shepherd, D.A. Shepherd, and S.A. Sarappo. 2002. Collision mortality of local and migrant birds at a large-scale wind power development on Buffalo Ridge, Minnesota. Wildlife Society Bulletin 30:879-887.

Karms, Kermit B. 1973. McIntosh County Cemeteries Supplement. Annotated copy on file, McIntosh County Registrar of Deeds, Ashley, ND.

KEM (KEM Electric Cooperative, Inc.). 2009. KEM Electric Cooperative, Inc. – About Us. http://www.kemelectric.com/About_Us/index.html, retrieved December 28, 2009.

Kerlinger, P., R. Curry, L. Culp, A. Jain, C. Wilkerson, B. Fischer, and A. Hasch. 2006. Post construction avian and bat fatality monitoring study for the High Winds wind power project. Solano County, California: Two Year Report. Prepared for High Winds, LLC, FPL Energy.

Klausing, Robert L. 1981. Ground-water Resources of McIntosh County, North Dakota. North Dakota Geological Survey, Bulletin 73 – Part III, Bismarck, North Dakota. County Ground-water Studies 30 – Part III. http://swc.state.nd.us/4dlink9/4dcgi/GetContentRecord/PB-268, retrieved December 22, 2009.

Knopf, F.L., and R.M. Evans. 2004. American White Pelican (*Pelecanus erythrorhynchos*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/057doi:10.2173/bna.57.

Lacki, M.J., J.P. Hayes, and A. Kurta, eds. 2007. Bats in Forests: Conservation and Management. John Hopkins University Press, Baltimore, MD.

Leddy, K.L., and K.F. Higgins, and D.E. Naugle. 1999. Effects of wind turbines on upland nesting birds in CRP grasslands. Wilson Bulletin 111:100-104.

Leistritz, Larry F., and Randal Coon. 2008. Socioeconomic Impacts of the Langdon Wind Energy Center. Agribusiness and Applied Economics Report No. 627.

Licht, D.S., and S.H. Fritts. No date. Gray wolf (*Canis lupus*) occurrences in the Dakotas. US Fish and Wildlife Service. Jamestown, North Dakota: Northern Prairie Wildlife Research Center.

Midwestern Governors Association. 2006. Policy Resolution on the *25 x '25 Initiative*. http://www.midwesterngovernors.org/resolutions/25X25%20Resolution.pdf.

NatureServe. 2008. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.2. NatureServe, Arlington, Virginia.

NDDOH (North Dakota Department of Health). 2007. Letter to USACE for 401 Certification of Nationwide Permits. Dated: 4.2.07. https://www.nwo.usace.army.mil/html/od-rnd/pn/nddh401cert.pdf

NDDOT (North Dakota Department of Transportation). 2008. 2008 Traffic Volume Map. http://www.dot.nd.gov/road-map/pdf/traffic/trafficstate_2008.pdf, retrieved December 23, 2009.

NDGFD (North Dakota Game and Fish Department). 2010. PLOTS Lands. http://web.apps.state.nd.us/imf/imf.jsp?site=NDGFPLOTSGuide.

NDGIS (North Dakota Geographic Information Systems). 2009. North Dakota GIS Hub Data Portal. http://web.apps.state.nd.us/hubdataportal/srv/en/main.home, retrieved December 2009.

NDGS (North Dakota Geological Survey). 1980. Surface Geology. http://web.apps.state.nd.us/hubdataportal/srv/en/main.home, retrieved , retrieved December 3, 2009.

NDGS. 2001. Bedrock Geology. http://web.apps.state.nd.us/hubdataportal/srv/en/main.home, retrieved December 3, 2009.

NDIC (North Dakota Industrial Commission). 2009. Oil and Gas: ArcIMS Viewer. https://www.dmr.nd.gov/OaGIMS/viewer.htm, retrieved December 28, 2009.

NDSWC (North Dakota State Water Commission). 2009. ND State Water Commission Mapservice. http://mapservice.swc.state.nd.us/, retrieved December 22, 2009.

North Dakota Aeronautics Commission. 2009. Airports in North Dakota. http://www.nd.gov/ndaero/airport/, retrieved December 22, 2009.

Ogle, George A., 1911 (reprinted 1960). Standard Atlas of McIntosh County, North Dakota. Midland Atlas Company, Inc., Milbank, SD.

PSC (North Dakota Public Service Commission). 1979. PSC Guidelines: Energy Conversion and Transmission Facility Siting. http://www.psc.state.nd.us/jurisdiction/pud/energy-conversion-siting-guidelines.pdf, retrieved December 28, 2009.

Ruff, Doug. 2009. Hunting and Fishing, Wishek, ND. http://www.wishek-nd.com/services/hunting_fishing.html, retrieved December 30, 2009.

Samson, F.B., F.L. Knopf, and W.R. Ostlie. 1998. Regional trends of biological resources--grasslands. *In* Status and trends of the nation's biological resources. Volume 2 (M.J. Mac, P.A. Opler, C.E. Puckett Haecker, and P.D. Doran, editors). U.S. Department of the Interior, Geological Survey, Reston, VA.

Sauer, J.R., J.E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, results and analysis 1966 - 2006. Version 05.15.2008. USGS Patuxent Wildlife Research Center, Laurel, MD.

Schneider, Mary Jane. 2002. Cultural Affiliations of Native American Groups within North and South Dakota: An Ethnohistorical Overview. Anthropology Research, University of North Dakota, Contribution No. 375, Grand Forks, ND.

SHPO (North Dakota State Historic Preservation Office), Site files. State Historical Society of North Dakota, Bismarck, ND. Reviewed in 2009.

Sterzinger, G., F. Beck, and D. Kostiuk. 2003. The Effect of Wind Development on Local Property Values. Renewable Energy Policy Project. May 2003. http://www.repp.org/articles/static/1/binaries/wind_online_final.pdf.

Swier, V.J. 2003. Distribution, roost site selection, and food habits of bats in eastern South Dakota. M.S. Thesis. South Dakota State University, Brookings, SD.

Tetra Tech. (Tetra Tech EC, Inc.). 2009a. 2009 Fall Avian Survey. *Prepared for:* CPV Energy. *Submitted:* December 18, 2009.

Tetra Tech. 2009b. Bat Likelihood of Occurrence Report for Ashley Wind Energy Project, McIntosh County, North Dakota. *Prepared for:* CPV Energy. *Submitted:* December 15, 2009.

Tetra Tech. 2009c. Native Prairie Survey Ashley Wind Energy Project, McIntosh County, North Dakota. *Prepared for*: CPV Energy. *Submitted*: December 15, 2009.

Tetra Tech. 2009d. Whooping Crane Likelihood of Occurrence Report for Ashley Wind Energy Project, McIntosh County, North Dakota. *Prepared for* CPV Energy. *Submitted* December 17, 2009.

Tetra Tech. 2010. Class I Cultural Resources Investigation Ashley Wind Energy Project, McIntosh County, North Dakota. CPV Ashley Renewable Energy Company, LLC. Prepared by Tetra Tech EC, Inc., Boston, MA.

Tobin, B.D., and Weary, D.J. 2005. Engineering Aspects of Karst. http://www-atlas.usgs.gov/mld/karst0m.html, retrieved December 3, 2009.

USACE (U. S. Army Corps of Engineers). 2005. Ordinary High Water Mark Identification. Regulatory Guidance Letter 05-05. December 7, 2005. Washington, DC.

USACE. 2007. Jurisdictional Determination Form Instructional Guidebook. http://www.usace.army.mil/cw/cecwo/reg/cwa_guide/jd_guidebook_051207/final.pdf

USACE. 2007. Regulatory Guidance Letter 07-01: Practices for Documenting Jurisdiction under Section 404 of the Clean Water Act and Sections 9 & 10 of the Rivers & Harbors Act of 1899. Issued June 5, 2007. Available online at [URL] http://www.usace.army.mil/CECW/Documents/cecwo/reg/rgls/rgl07-01.pdf. Last accessed March 17, 2010.

USACE and USEPA. 2007. *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook*. Published May 30, 2007. 60 pp. Available online at [URL] http://www.usace.army.mil/CECW/Documents/cecwo/reg/cwa_guide/jd_guidebook_051207final.pdf. Last accessed March 17, 2010.

USACE. 2008. *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-12. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USCB (U.S. Census Bureau). 2000. American FactFinder. http://factfinder.census.gov/home/saff/main.html?_lang=en, retrieved December 28, 2009.

USDA (United States Department of Agriculture). 2006. USDA Agricultural Handbook 296; Major Land Resource Regions Custom Report. http://soils.usda.gov/ MLRAExplorer, retrieved December 17, 2009.

USDA. 2007. 2007 Census of Agriculture – County Profile. http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/North_Dakota/cp38051.pdf, retrieved December 17, 2009.

USDA. Natural Resources Conservation Services (NRCS). 2008. Soil Survey Geographic (SSURGO) database for McIntosh County, North Dakota. http://SoilDataMart.nrcs.usda.gov/, retrieved December 18, 2009.

USFWS (United States Fish and Wildlife Service). 2002a. Proposal of the critical for the northern great plains breeding population of the piping (*Charadrius melodus*). U.S. Fish and Wildlife Service South Dakota Ecological Services Field Office Pierre, South Dakota.

USFWS. 2002b. Status Assessment and Conservation Guidelines, Dakota skipper.

USFWS. 2008a. Flyways. Retrieved from: http://flyways.us/flyways/central.

USFWS. 2008b. Endangered, Threatened, Proposed, and Candidate Species: North Dakota Counties. Available at: http://www.fws.gov/mountain-prairie/endspp/countylists/northdakota.pdf, accessed on December 23, 2008.

USGS (U.S. Geological Survey). 2008. National Seismic Hazard Maps – 2008. Available at: http://gldims.cr.usgs.gov/website/nshmp2008/viewer.htm

WBWG (Western Bat Working Group). 2009. Regional bat species priority matrix. Retrieved 23 July 2009 from http://wbwg.org/speciesinfo/species_matrix/species_matrix.html

WindPower. 2003. Danish Wind industry Association. Shadow Casting From Wind Turbines. http://www.windpower.org/en/tour/env/shadow/index.htm. Accessed 9/8/08.

Wishek, Nina Farley. 1941. Along the Trails of Yesterday, A Story of McIntosh County. The Ashley Press, Froh, ND.

Young, D.P., Jr., W.P. Erickson, R.E. Good, M.D. Strickland, and G.D. Johnson. 2003. Avian and bat mortality associated with the initial phase of the Foote Creek Rim Wind Power Project, Carbon County, Wyoming: November 1998 - June 2002. Technical Report prepared by WEST, Inc. for Pacificorp, Inc., SeaWest Windpower, Inc. and Bureau of Land Management.

Figures

Appendices

Appendix A
CPV Policies and Commitments to the Environment

Appendix B
Design Data Report

Appendix C
Studies and Assessments

Native Prairie Survey

Bat Likelihood of Occurrence Report

Whooping Crane Likelihood of Occurrence Report

2009 Fall Avian Survey

Class I Cultural Resources Investigation

Comsearch Microwave Study

Aviation Systems, Inc. Feasibility Evaluation

Appendix D
Example Determination of No Hazard

Appendix E
Agency Correspondence

Appendix F
Pre-Construction Investigation Protocols

Appendix G
Ten-Year Plan