

Existing Environment

Species lists of vertebrates known or likely to occur on or near the project area were developed through literature review and in consultation with agency personnel. Checklists of North Dakota birds (Stewart 1975; Faanes and Stewart 1986), mammals (Grondal no date), and amphibians and reptiles (Hoberg and Gause 1992) were available online through the USGS Northern Prairie Wildlife Research Center. Additionally, species lists for Burleigh County were provided by a NDGFD non-game biologist (presented as received in **Appendix C**). The sources yielded general distribution information that aided in developing the species lists for the project area.

Based on the review of these species distribution lists, known wildlife habitat affinities, and site-specific survey data, 7 amphibian, 9 reptile, 68 bird, and 52 mammal species were identified that may occur in the project area. Surveys were conducted during 2005 to document avian and other wildlife use in the project area (Tetra Tech, Inc. 2005). During site survey activities conducted in 2005, 65 wildlife species (53 bird species and 12 mammal species) were observed within or adjacent to the project area (Tetra Tech, Inc. 2005). Locations of raptor stick-nests and sharp-tailed grouse leks found during these surveys are shown on **Figure 3-1**. No site-specific amphibian, reptile, or mammal surveys were conducted within the project area.

Environmental Consequences

A significant impact to wildlife resources would occur if the Proposed Action resulted in the loss of individuals of a population leading to the listing of or jeopardizing the continued existence of animal species. Impacts to wildlife could be short-term (one or two reproductive seasons, generally during the construction period), or long term (affecting several generations during the life of the project). Impacts can be direct (an immediate affect to an individual, population or its habitat), or indirect (an affect that may occur over time or result from other actions).

Construction activities that remove vegetation and disturb soil may cause direct impacts to individuals of less-mobile species (e.g., small mammals, amphibians, reptiles) through direct mortality or displacement and exposure to predators. More mobile species (medium to large mammals and birds) would be expected to disperse from the area of disturbance during construction, returning following completion of these activities.

Disturbance to wildlife from noise, vehicles, and human presence would be localized and short-term in nature. Vehicles traveling access roads could kill small mammals, reptiles, or birds, though more mobile

species would be able to avoid impacts from vehicles. Nests of ground-nesting birds could be destroyed by vehicle traffic if construction activities occur during spring and early summer months when birds are nesting. However, these losses are not expected to cause significant impacts to overall wildlife populations because construction would not occur during the nesting season.

Staging and construction activities associated with the Proposed Action would require access to gravel. Gravel for use during the project would be obtained from currently a active gravel pit near the project site. The selected contractor's current gravel source is located in the East ½ Northwest ¼ Section 27, Township 144 North, Range 80 West. Use of this existing gravel pit would prevent the loss of additional wildlife habitat caused by mining gravel resources near the Project Area.

Construction activities could result in an accumulation of trash and food scraps that may be attractive to scavengers. Scavengers, such as raccoons or ravens, pose a threat to ground-nesting birds or other ground-dwelling wildlife species susceptible to predation. Waste containment measures would be implemented as described in Chapter 2 of this document. All waste material would be secured from scavengers and removed from the construction site daily. Any attraction of scavengers to the construction area would be of short duration and would not affect populations of wildlife in the area.

As part of the Proposed Action, approximately 4.4 miles of 230-kV overhead transmission line and 8 miles of 34.5-kV overhead transmission line would be constructed (Figure 3-1). Impacts to individual birds and associated mortality resulting from transmission line facilities interactions may occur. Based on the studies conducted, waterfowl, shorebirds, cranes, and other birds with a high wing loading to low wing aspect ratio (Crowder 2000) appear to be most susceptible to powerline collisions. This is particularly true when powerlines are located near wetlands. In upland habitats, raptors and passerines appear most susceptible to mortality from interactions with wind turbines (NWCC 2004).

To minimize bird collisions with overhead lines, all east-west oriented 34.5-kV overhead collector lines would be marked with state-of-the-art line marking devices. Habitats in the proposed powerline corridors are primarily agricultural row crop habitats, with few aquatic and grassland habitats. The 34.5-kV overhead line portion of the Proposed Action is not expected to bisect daily movement patterns of avian species due to the small amount of suitable habitat located within and adjacent to the proposed powerline corridors. Burnt Creek is a possible exception and may be a communication flyway between areas south of the project area and the Audubon National Wildlife Refuge. The entire length of the proposed 230-kV overhead transmission line, including the crossing of Burnt Creek, would be marked with approved devices in accordance with the manufacturer's recommendation. All 34.5-kV overhead lines that bisect

communication flyways (as observed by project or agency personnel or documented through collisions) would also be marked with state-of-the-art line marking devices.

To minimize the possibility of electrocution on above-ground portion of the collector system ground wires on the 34.5-kV poles would be covered and would not stick up beyond the top of the poles. Pole mounted insulators would be rated for 69-kV.

Mortality to birds resulting from collision with turbines at wind generation projects has been described at other wind generation projects (Nelson and Curry 1995; Osborn et al. 2000; Johnson et al. 2002) and these reports have identified avian mortality due to collisions as an issue. The magnitude of the issue has been described as site-specific. In Minnesota, Johnson et al. (2002) classified 71 percent of documented avian collision mortalities as migrants and 76 percent of those were passerines. Estimated mortality rates for 8-month periods ranged from 0.98 to 4.4 collisions per turbine (ca. 1.5-6.6 collisions/turbine/year), with the highest rate being due primarily to a single mortality event that may have been weather-related (Johnson et al. 2002). Data collected from a number of studies conducted prior to 2004 indicate an average of 2.19 avian fatalities per turbine per year in the United States for all species combined and 0.03 raptor fatalities per turbine per year (NWCC 2004). Avian collisions with turbines may be influenced by such factors as annual migration and local movement patterns, turbine size, and weather.

Avian mortality in association with turbines has been reduced by locating the Wind Energy Center and turbines where birds are less likely to encounter them relative to other areas in the region. While it is possible that there would be impacts to individual birds as a result of collisions with the wind turbines and transmission lines of the Proposed Action, the Wind Energy Center has been situated in an area with a low density of wetlands relative to areas to the north and east and away from the Missouri River corridor, an area of known high avian use (Figure 1-1 and Figure 3-1). Individual turbine towers would be located on ridgelines and hilltops, away from low passes between wetlands where shorebirds and waterfowl are more likely to fly. This would reduce the likelihood of avian collisions.

The Wind Energy Center would use improved turbine and tower designs (e.g., solid towers rather than lattice towers) to further reduce avian mortality. Strobe lights would be placed on towers, which may promote avoidance by night-flying birds. In addition to the specific design measures that would reduce avian mortality, during the first year of commercial operation biologists would conduct periodic searches of the wind generation project for carcasses in accordance with the mortality monitoring procedures developed in consultation with USFWS. Searches would be conducted at times coinciding with annual migration, as well as during the nesting season (late spring and summer) and during late summer fledging

season to identify impacts to avian species. Local USFWS and NDGFD personnel would be notified if carcasses of migratory birds or federally-listed species or injured animals are found during these surveys. Notification would occur within 48-hours of incidents involving endangered species. A report summarizing the findings of the mortality monitoring surveys and observations made in accordance with FPL's Wildlife Procedures Manual (as noted in Chapter 2) would be prepared and submitted to USFWS.

During consultations, the USFWS expressed concerns regarding migratory birds and powerline interactions, as well as construction through wetlands and stream channels (Towner 2005). To address their concerns, the USFWS offered the following recommendation:

- Poles and other construction for overhead lines should be sited to avoid placement of fill in wetlands along the route.
- If construction is unavoidable in or near wetlands or streams, the following recommendations should be implemented:
 - Defer the timing of construction to late summer (after July 15) or fall so as not to disrupt waterfowl or other wildlife during the nesting season and to avoid high water conditions.
 - Replace unavoidable loss of wetland functions on an ecological value-for-value basis and trees or shrubs on a 2:1 basis.
 - Reseed disturbed grassland with a mixture of regionally native grass and forb species.
- New overhead powerlines should be constructed in accordance with the current guidelines for preventing raptor electrocutions as described in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996* (APLIC 1996).
- If birds are found to be colliding with the transmission line, the USFWS recommended the lines be modified according to guidelines described in *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994* (APLIC 1994).
- Develop a voluntary Avian Protection Plan in accordance with the *Avian Protection Plan (APP) Guidelines* (APLIC and USFWS 2005) and the specific needs of the Burleigh County Wind Energy Center.

ENDANGERED, THREATENED, PROPOSED, CANDIDATE AND OTHER SENSITIVE SPECIES

The connection of the Proposed Action to Western's Garrison-Bismarck 230-kV Transmission Line is a Federal action. As a result, Western is the lead Federal agency responsible for ESA Section 7 compliance. The area of study for special status species was essentially the same as that for wildlife resources, with focus on the project area (Figure 3-1).

Existing Environment

Lists of protected species and species of concern are maintained by both Federal and state agencies. These listings are discussed separately below.

Federally Listed Species

The Endangered Species Act (ESA) requires protection of species Federally-listed as threatened or endangered and any habitat designated as essential to the maintenance or recovery of a listed species (designated critical habitat). One of the purposes of the ESA is to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved," (16 U.S.C. § 1531(b)). The designation of "critical habitat" serves several important express purposes and also informs other aspects of habitat protection under the ESA. The ESA allows for the protection of habitat in several ways, including: classifying impacts to critical habitat as a prohibited "take" of a particular species, the purchase of lands for critical habitat, cooperative programs with states, consultation on Federal actions or actions with a Federal nexus, and issuance of incidental take permits based, in part, on habitat protection.

Projects that may adversely affect listed or proposed species require formal consultation with USFWS. Significant changes to habitats of these species and projects that may result in a "take" require close scrutiny by the USFWS and may require special permitting or mitigation measures to lessen or mitigate effects.

A request was submitted on March 25, 2005, to the USFWS Ecological Services Office in Bismarck, North Dakota for information on endangered, threatened, proposed, and candidate that may be present in the project area. Of the Federally-listed species known to occur in North Dakota, the bald eagle (*Haliaeetus leucocephalus*), whooping crane (*Grus americana*), interior least tern (*Sterna antillarum*), and piping plover (*Charadrius melodus*) are all known to occasionally or frequently occur near the

Project Area, primarily in the Missouri River corridor. Other species such as Gray wolf (*Canis lupus*) may also occasionally be present but are either infrequently observed or have only historic range in the Project Area. No Federally-listed species were observed during site surveys in 2005.

State Protected and Other Species of Conservation Concern

Through the Wildlife Conservation and Restoration Program (now known as State Wildlife Grants) legislation of 2001, NDGFD has identified 100 species in decline at the national, regional, or state level, or species whose population status is not well known, but thought to be in decline. These species are ranked by the NDGFD in three priority levels (Level I, Level II and Level III) based on factors such as: known status, funding available for conservation, and presence of breeding habitat in North Dakota (NDGFD 2004). A description of the priority levels is as follows:

- *Level I* - Species which have a high level of conservation priority because of declining status either in North Dakota or across their range; or a high rate of occurrence in North Dakota constituting the core of the species' breeding range, but are at-risk range wide, and non-State Wildlife Grant funding is not readily available to them.
- *Level II* - Species having a moderate level of conservation priority; or a high level of conservation priority, but a substantial amount of non-State Wildlife Grant funding is available to them.
- *Level III* - Species which have a moderate level of conservation priority, but are believed to be peripheral or do not breed in North Dakota.

A request was submitted on March 25, 2005, to the NDGFD office in Bismarck, North Dakota for information on state species that may be present in the project area. The sensitive species observed in the project area are shown in **Table 3-1**.

Environmental Consequences

A significant impact to endangered, threatened, proposed, and candidate species would occur if: 1) the Proposed Action resulted in the loss of individuals of a population leading to a jeopardy opinion from the USFWS; or 2) the Proposed Action resulted in the loss of individuals leading to the upgrade (e.g., change in listing from threatened to endangered) of the Federal listing of the species.

TABLE 3-1
North Dakota Game and Fish - Birds of Conservation Priority

Common Name	Scientific Name	Priority Level
Northern harrier	<i>Circus cyaneus</i>	Level II
Swainson's hawk	<i>Buteo swainsoni</i>	Level I
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	Level II
Willet	<i>Catoptrophorus semipalmatus</i>	Level I
Upland sandpiper	<i>Bartramia longicauda</i>	Level I
Marbled godwit	<i>Limosa fedoa</i>	Level I
Sprague's pipit	<i>Anthus spragueii</i>	Level I
Baird's sparrow	<i>Ammodramus bairdii</i>	Level I
Grasshopper sparrow	<i>Ammodramus savannarum</i>	Level I
Bobolink	<i>Dolichonyx oryzivorus</i>	Level II

The project area was surveyed for threatened, endangered, or candidate species on three occasions during the spring of 2005. The project area is not representative of bald eagle, whooping crane, interior least tern, and piping plover breeding habitat, and these species are not known to reside in the project area. In addition, these species were not observed during site surveys in the vicinity of the Proposed Action (Tetra Tech, Inc. 2005). It is possible that migrating whooping cranes could use the limited wetlands resources or uplands in the vicinity of the project area for feeding or roosting. While it is possible that these species could collide with turbines or overhead lines, such collisions are unlikely. Migrating bald eagles and whooping cranes tend to fly at altitudes well above the height of wind turbines. Also, because bald eagles and interior least terns tend to migrate along river corridors, they are less likely to migrate through the project area. However, elevations used when these birds move between feeding, resting, and loafing areas may result in collisions.

Suitable nesting habitat for piping plovers or interior least terns is non-existent within the project area, further reducing the likelihood of significant impacts to these species. Because piping plovers and interior least terns are not common inhabitants of the project area, they are not expected to experience direct or indirect impacts as a result of the Proposed Action.

The proposed action may result in the long-term loss of some foraging and loafing habitat of the whooping crane. Loss of winter feeding- and resting-cover is the main reason for the decline of the species (USFWS 1970). Some wetlands and native grasslands occur in the project area, and USFWS records indicate that whooping cranes have been observed in the vicinity of the project area (Terry Ellsworth pers. comm. 2005b). Due to the current size of the population of whooping cranes, direct and

indirect impacts to an individual whooping crane may constitute a significant impact. Marking of the 230-kV overhead transmission line was recommended by USFWS and incorporated into the proposed action to minimize potential for collisions. East-west oriented portions of the 34.5-kV overhead collection line would also be marked.

Bald eagles, Northern harrier, Swainson's hawk, sharp-tailed grouse, willet, upland sandpiper and marbled godwit may experience direct and indirect impacts to individuals. However, impacts are not likely to contribute to population decline.

Impacts to species of concern would be reduced by use of modern turbine and tower designs (e.g., solid towers rather than lattice towers), state-of-the art line marking techniques and development of an Avian Protection Plan for the Wind Energy Center. Environmental protection measures described in Chapter 2 of this document and the additional mitigation measures described in this Chapter (particularly in the previous "Wildlife" section) would further reduce impacts.

SOCIAL RESOURCES

SOCIOECONOMICS

The socioeconomic setting and potential impacts of the Proposed Action were evaluated on a regional basis with emphasis placed on Burleigh County. Regional and state-wide economic data are also discussed to allow comparison.

Existing Environment

The Proposed Action would be located in the northwestern portion of Burleigh County, near Wilton North Dakota, within a rural agricultural area. The following towns and communities in Burleigh County are located within 6 miles of the Proposed Action area (2000 census populations, as available):

- South Wilton (population 242);
- North Wilton (population 565);
- Regan (population 43);
- Wing (population 124);
- Wogansport; and
- Baldwin.

Services in these communities are limited. The largest near-by city, located approximately 20 miles south of the Proposed Action area, is Bismarck, North Dakota with a population of approximately 55,532 (U.S. Census Bureau 2003). This city offers a full range of services and is the capital of North Dakota. Bismarck has a variety of support services, including medical centers. The nearest hospital to the project area is St. Alexius Medical Center.

In 2003, the U.S. Census Bureau estimated Burleigh County had a population of 71,693, an increase of 3.3 percent from the 2000 census count of 69,416, and an increase of over 16 percent since the 1990 census (U.S. Census Bureau 2004). The county contains approximately 1,633 square miles, with a current population density of just over 42 people per square mile.

General demographics of the county, as measured in 2000, showed 95 percent of the population is composed of Caucasians, who are not of Hispanic or Latino origin (see Environmental Justice section below). At the time of the 2000 census, the median age of Burleigh County residents was 35.9, and 12 percent of the county population was 65 or older.

According to the 2000 census, the workforce in Burleigh County was involved in the following:

- Services (Health, Legal, Business, Others) – 35.9 percent;
- Retail Trade – 18.7 percent;
- Government – 17 percent;
- Finance – 6.9 percent;
- Transportation & Public Utilities – 5.4 percent;
- Construction – 5.4 percent; and
- Wholesale Trade – 3.9 percent.

Per capita income in 1999 was \$20,436; median household income for the region for the same period was \$41,309, which was about 16 percent more than the statewide median of \$34,604 (U.S. Census Bureau 2000). Unemployment in Burleigh County was 3.4 percent in March 2005, compared with 4.2 percent statewide (Northwest Area Foundation 2005).

Environmental Consequences

Significant socioeconomic impacts would occur if the Proposed Action resulted in the degradation or commitment of existing goods and services to an extent that would limit the sustainability of existing communities.

Impacts from the Proposed Action on social and economic resources are expected to be short-term (less than 16 months). Measurable effects of the Proposed Action would likely follow the build-up and execution of the construction phase of the Proposed Action, which is expected to require up to 4 months to complete. The project would include two construction phases. The first phase would occur in 2005 and is expected to last approximately 4 months; the second phase would likely occur in 2006 and may occur over more than 4 months.

Construction crews would range from 80 to 120 personnel for the Proposed Action during each of the phases. Approximately 60 to 70 percent of the work force would be recruited locally. During peak construction, the estimated monthly payroll would range from \$480,000 to \$760,000.

Local businesses such as motels, restaurants, bars, gas stations, and grocery stores would likely experience some increase in revenue resulting from new employment of the non-resident portion (30 to 40 workers) of project construction crews. In particular, the consumption of goods, services, and temporary lodging in and near Bismarck, Wilton, and surrounding cities could be expected to minimally increase due to the presence of these non-native workers. Other local area businesses that may benefit through increased sales would likely include ready-mix concrete and gravel suppliers, hardware and general merchandise stores, welding and machine shops, packaging and postal services (Federal Express, United Parcel Service, U.S. Postal Service), and heavy equipment repair and maintenance services.

This relatively small increase in demand for local goods and services would not be minimal due to the small size of the non-local workforce and the short-term nature of the construction phase of the Proposed Action. For the same reasons, the effects to infrastructure such as schools, hospitals, housing, and utilities would also be minimal.

The North Dakota Department of Commerce determined that the Proposed Action would result in no detrimental changes to existing goods and services (NDDOC 2005).

ENVIRONMENTAL JUSTICE

The goal of environmental justice is to ensure the fair treatment and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of potentially adverse human health and environmental effects

of a Federal agency action, operation, or program. Meaningful involvement means that affected populations have the opportunity to participate in the decision process and their concerns are considered.

Executive Order (EO) 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*) is intended to ensure that adverse human health and environmental effects of agency actions would not disproportionately impact minority and low-income populations, including Native American Indian Tribes. For purposes of this section, minority and low-income populations are defined as follows:

Minority Populations – People of Hispanic or Latino origin of any race, Blacks or African Americans, American Indians or Alaska Natives, Asians, and Native Hawaiian and other Pacific Islanders.

Low-Income Populations – People living below the national poverty level. In 2000, the weighted-average poverty threshold for a family of four was \$17,603, and \$8,794 for an unrelated individual.

EO 13045 (*Protection of Children from Environmental Health Risks and Safety Risks*) is intended to ensure adverse human health and environmental effects of agency actions would not disproportionately impact child populations.

Existing Environment

Estimates of two populations of concern (minority and low income) were developed to determine if environmental justice populations exist in Burleigh County (Table 3-2; U.S. Census Bureau 2005a,b).

The Standing Rock Sioux Reservation and the Fort Berthold Indian Reservation are approximately 50 miles from the project area. These two regions may represent the closest minority or low-income populations in the region.

TABLE 3-2
Minority and Low-Income Populations

Location	Total Population	Percent Minority	Percent Below Poverty
Burleigh County	69,416	5.4	7.8
State of North Dakota	642,200	8.3	11.9

The median family/household income for the region surrounding the project area is about 16 percent greater than the statewide average. Consequently, income does not constitute a condition that warrants focus under EO 12898.

Children and sensitive receptors exist near the Proposed Action area. However, the proximity of children and sensitive receptors to the Proposed Action does not constitute a condition that warrants focus under EO 13045.

Environmental Consequences

With regard to EO 12898, an impact would be considered significant if a low-income, minority, or subsistence population in the region of the Proposed Action was disproportionately affected by the Proposed Action.

Because of the distance of the Proposed Action from the Standing Rock and Fort Berthold Indian Reservations, no impacts to the economy, environment, or culture of the reservations are anticipated. In addition, Western's interactions with North Dakota Indian tribes are intended to address potentially adverse impacts to tribal interests outside the reservations. Therefore, discrimination toward or disproportionate impacts to low-income, minority, and subsistence populations resulting from the Proposed Action are not anticipated.

LAND USE

The evaluation for land use was focused on the project area (**Figure 3-1**), but includes some discussion that establishes the regional setting of the Proposed Action.

Existing Environment

The Proposed Action is located in the Ecklund and Ghylin Townships in Burleigh County, North Dakota. Local land use features in the project area include existing transmission lines, rural roads, rural residences, and agricultural properties. Agricultural properties comprise the majority of the project area and include lands used for a variety of agricultural purposes. Specific acreages of different agricultural land uses within the project area are not available because they change from year to year based on market trends and farm-specific operational requirements.

Hayland, cropland, and pasture are managed for the production of livestock forage and cereal crops within agricultural tracts. Management may include fertilization, weed and brush control by pesticide application, and management of fallow fields, tillage, and reseeding. Species composition often includes mixes of grasses and legumes, small grain hay, or monocultures of legumes such as alfalfa or clover. No prime or unique farmlands exist within the project area.

Environmental Consequences

Land-use impacts would pertain to physical and operational effects of the Proposed Action on existing and future land use. In the project area, these impacts are primarily related to agricultural practices. A significant impact would occur if: 1) the Proposed Action resulted in the uncompensated loss of crop production; or 2) the Proposed Action resulted in the foreclosure of future land uses.

Temporary and short-term impacts would occur from construction activities due to removal of existing agricultural land from crop or forage production. Permanent disturbance and loss of vegetation would result from installation of access roads, the substation, and turbine foundations and other permanent facilities.

Western, Burleigh County Wind, and Central Power would compensate landowners for land, both purchased and leased, that is required for the Proposed Action. However, construction of proposed facilities would affect existing agricultural uses locally and would be both short- and long-term, in duration.

Short-term effects would include a temporary loss of cropland during construction. Long-term impacts would include:

- Loss of cropland under and around structures;
- Modified farming operations near and around structures;
- Damage to farm equipment through collisions with proposed facilities; and,
- Modified aerial application of herbicides and fertilizers.

Impacts to existing land uses and agricultural practices have been reduced by siting structures in previously disturbed areas, or in areas where agricultural practices are already limited (along existing roads etc) or have been modified.

Less than 1 percent of the project area would be occupied by the proposed facilities and associated surface disturbances. In addition, land uses were among the considerations during siting of the wind generation project and ancillary facilities. As a result of these considerations and the implementation of environmental protection measures, the Proposed Action would not foreclose future land uses.

Environmental protection measures as described in Chapter 2 of this document would be implemented to minimize or avoid potential land use impacts from the Proposed Action. In addition, Western, Burleigh County Wind, and Basin would provide fair market value compensation to landowners for purchased and leased land.

VISUAL RESOURCES

The analysis of the visual study area was considered to be the general project area, including the wind energy center and those residential areas and roadways along the ROW of the proposed 230-kV transmission line connecting the wind energy center to the Garrison-Bismarck 230- kV Transmission Line (Figure 2-1).

Scenic quality is determined by evaluating the overall character and diversity of landform, vegetation, color, water, and cultural or manmade features in a landscape. Typically, more complex or diverse landscapes have higher scenic quality than those landscapes with less complex or diverse landscape features.

Existing Environment

The project area lies in a rural location with farming, livestock grazing, and related agricultural operations dominating land use. The area within the vicinity of the proposed Wind Energy Center consists of a rolling to moderately hilly landscape with prominent ridges trending in a northwesterly to southeasterly direction. The visual resources of the area are neither unique to the region nor entirely natural.

Structure and color features in the visual region of influence include those associated with wetlands, cultivated cropland, pasture, forested shelterbelt, and additional human-caused features described above. Colors vary seasonally and include green crop and pasture land during spring and early summer, green to brown crops and pasture during late summer and fall, brown and black associated with fallow farm fields year round, and white and brown associated with late fall and winter periods.

Key observation points (KOPs) are viewing locations that represent the location of the anticipated concentration of sensitive viewers (or the highest incidence of sensitive viewers) near the Proposed Action. KOPs for the Proposed Action include roadways such as: U.S. Highway 83 (located west of the project area), State Highway 36 (located north of the project area), 93rd Street (located east of the project area), 266th Avenue (located south of the project area), and occupied residences within the vicinity of the project area. There are approximately 15 occupied residences within the visual region of influence of the project area.

Currently, no distinctive landscape features exist in the project area that would require specific protection from visual impairment.

Environmental Consequences

Visual resources reflect aesthetic qualities of the landscape in terms of its public viewing value and sensitivity to change. Significant impacts to visual resources would occur if the Proposed Action interrupts a unique viewshed from a KOP.

Wind turbines, transmission lines and structures, and construction of access roads would result in changes to public views. The uppermost portion of the turbine blades would reach 360 feet above ground surface and would be visible for up to several miles, changing the visual character of the area from agricultural to quasi-industrial. These structures would be visible from all of the identified KOPs. Structures and facilities in the Wind Energy Center would be anywhere from 2,200 feet to 980 feet away from nearby highways. Some of the turbines would require strobe lights for aircraft safety, potentially changing the view from KOPs. Visual effects would decrease as the distance from the Wind Energy Center increases.

The transmission line would bisect the rural areas from the turbine array to the substation and continue west to the point of interconnection. The transmission line would be approximately 75 feet tall and would be visible from KOPs such as U.S. Highway 83, 266th Avenue, and many of the occupied residences. Two of the homes within the transmission corridor are within the 500-foot buffer and have signed consent agreements. The appearance of the transmission line would result in changes to the aesthetics of the landscape. Landowner concerns are a consideration in the ROW agreements negotiated along the route.

Impacts on visual resources within the project area were determined by considering the post-construction views from the KOPs, as discussed above. The project area does not contain any highly distinctive or important landscape features, registered cultural resources, or unique viewsheds. In addition, there are no visual quality standards in place within Burleigh County.

NOISE

Evaluation of noise was limited to potential receptors within the project area (Figure 2-1).

Existing Environment

The project area is located in a rural, predominantly agricultural area. As a result, sources of background noise to rural residents and occasional visitors to the area include: wind, agricultural activity, recreation (primarily hunting), vehicles traveling on U.S. Highway 83; State Highway 36, and low-traffic gravel roads such as 266th Avenue, 52nd Street, 93rd Street, and 132nd Street. Typical baseline noise levels in the project area likely range from approximately 38 average day-night sound levels measured in A-weighted decibels (dBA) to 48 dBA (USEPA 1978).

Potential noise receptors in the vicinity of proposed facilities include scattered rural residences, the closest of which is approximately 1,640 feet from one of the proposed turbine sites. Figure 2-1 shows the locations of occupied residences in the project area.

Environmental Consequences

Significant impacts would occur if the Proposed Action results in noise levels in exceedence of national standards.

The National Safety Council (NSC) recommends no more than 85 dBA for 8 hours of exposure as the safe limit for farm operations. Industrial standards of the Occupational Safety and Health Administration (OSHA) regulations would apply to those involved in the construction, operation, and maintenance of the facilities. OSHA permissible noise exposures are shown in Table 3-3.

TABLE 3-3
OSHA Permissible Noise Standards

Duration (number of hours per day)	Sound Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.75	110
0.5	115

Noise generated by construction activities would occur intermittently over the construction period and would be generated by an increase in traffic on local roads, as well as heavy equipment operation. Available estimates from other wind farm construction projects indicate that the maximum noise levels from heavy equipment would be 85 to 88 dBA at a distance of 50 feet (Western 2003). Given that the distance to residences from any turbine is expected to be greater than 1,500 feet, noise levels are not expected to be exceeded and noise issues are not expected to be a concern at this project site.

Noise associated with the proposed transmission line construction is expected to be localized and short-term. All construction operations would occur during daylight hours. Two residences are located within 500 feet of the transmission line as shown in **Figure 2-1**. These landowners have been contacted and the proximity approved. Occupants of residences in proximity, but not within 500 feet of the line, would be contacted prior to construction to further reduce annoyances and other potential impacts from these operations.

Corona-generated audible noise from transmission lines is generally characterized as a crackling, hissing noise. The noise is most noticeable during wet-conductor conditions such as rain, snow, or fog. Transmission-line audible noise is measured and predicted in dBA. Some typical noise levels are light automobile traffic at 100 feet, 50 dBA; an operating air conditioning unit at 20 feet, 60 dBA; and freeway traffic or freight train at 50 feet, 70 dBA. This last level represents the point at which a contribution to hearing impairment begins. The average noise-level during wet weather at the edge of the ROW for the proposed transmission line is anticipated to be 46 dBA at 230 kV.

Noise estimates for wind generation projects of comparable size have been previously modeled. Model variables included turbine noise levels of 105 dBA, wind speed of 8 meters per second, no tonal noise, no background noise, and a noise threshold set to 50 dBA. Model results indicate a noise level range of between 45 and 50 dBA at 1,000 feet distance around the proposed wind generation project. Based on the expected typical baseline noise levels for the area (between 38 to 48 dBA) and given the wind speeds used for the calculations (8 meters per second), ambient noise levels would likely approach or mask entirely the noise generated from the turbines. Noise level standards set by NSC and OSHA would not be exceeded and the long-term increase in noise levels would be minimal.

TRANSPORTATION

The analysis area that would be used to determine impacts on transportation from the Proposed Action would be the area delineated by roadways adjacent to the project area. These roadways have been identified as: U.S. Highway 83 (located west of the project area), State Highway 36 (located north of the project area), 266th Avenue (located south of the project area), and 132nd Street (located east of the project area).

Existing Environment

The turbine array is located east of U.S. Highway 83 and south of State Highway 36. U.S. Highway 83 has a junction with Interstate 94 approximately 20 miles south of the project area. The road located south of the project area (266th Avenue) has a gravel surface and is a major collector that has a junction with U.S. Highway 83 to the west. Several roads lie either within the project area or east of the project area. These roads are 52nd Street, 93rd Street, and 132nd Street. All of these roads have gravel surfaces and receive a low volume of traffic. Motor vehicle traffic along the majority of roads within the vicinity of the project area is considered light, with low speed and low volume.

Environmental Consequences

Significant impacts would occur if: 1) the Proposed Action resulted in the permanent disruption of regional and local traffic; or 2) the Proposed Action results in the destruction of existing transportation infrastructure.

Construction of the Proposed Action would increase traffic on local roads to the site, possibly causing temporary impacts to local traffic flow while equipment is hauled to the site. There are several roads adjacent to the project area in which construction-related traffic would be concentrated. Construction-related vehicles would use 52nd Street, 93rd Street, and 66th Street, as they access the project area off of State Highway 36. In addition, a portion of 52nd Street would be improved for the purpose of transporting materials and equipment. These improvements would remain in place after construction is completed. A portion of the construction-related traffic would also occur on 266th and 279th Avenues. The construction company hired to build the project would obtain any necessary permits for transporting equipment. The North Dakota State Highway Patrol and NDDOT would be contacted regarding the transmission line crossing of U.S. Highway 83.

Construction activities associated with the Proposed Action would use the existing section line roads whenever possible. The Proposed Action would include approximately 7.2 miles of roads associated with the turbines and other support facilities installed during 2005; this estimate includes those section-line roads that would be upgraded. These roads would be constructed to assist with access and maintenance of the proposed facilities. Future roads associated with the expansion turbines would be constructed or upgraded to provide access to the expansion turbine locations. The precise location of these proposed future roads have not yet been determined.

Operation of the wind energy center is not expected to result in any significant traffic issues on the area highways or state roads because there would be only a minor increase in traffic (potentially two vehicles per day). In addition, the necessary permits would be obtained and safety protocols implemented.

SAFETY AND HEALTH ISSUES

Evaluation of safety and health issues was limited to the project area (Figure 2-1). This evaluation specifically focused on areas in the immediate vicinity of proposed wind turbines, access roads, transformers, buried and overhead transmission lines, and substations.

Existing Environment

The predominant activities that currently occur within the project area include agriculture and vehicular travel. The safety regulations for these activities are defined and enforced by Federal and state agencies.

Environmental Consequences

For the purpose of this analysis, a significant impact to public safety and health would occur if 1) the Proposed Action resulted in an increase in personal injuries; 2) the Proposed Action resulted in an increase in health risk to area residents; 3) the Proposed Action resulted in impacts to public health as a result of increased electric and magnetic fields; 4) the Proposed Action resulted in an increase in injuries or fatalities related to increased traffic during the construction and operation of the wind energy center; or 5) the Proposed Action resulted in a violation of Federal, state, or local regulations regarding handling, transport, or containment of hazardous materials.

Public Safety

Work plans and specifications would be prepared to address public safety during project construction. On such occasions that people not involved in facilities construction or operation are present, safety precautions such as fencing, limitations on access to high hazard areas, and provision of adult supervision would be implemented. Because of the distance and the construction/operation site control measures anticipated during these phases, it is anticipated that the project would not adversely influence the health of area residents.

Worker Safety

Project construction work plans and specifications would be prepared to address worker safety during Proposed Action construction. Preparation of these documents would include appropriate performance provisions for worker protection as is required under OSHA with emphasis on CFR 1926 – *Safety and Health Regulations for Construction*. Because development and preparation of these documents would be prepared as part of FPL Energy’s contractor bid specifications, there would be no increase in injuries to workers. In addition, all workers would adhere to the safety standards and guidelines set forth by all parties involved in the Proposed Action.

Electric and Magnetic Fields

The proposed transmission line for the project area is a 230-kV line. At maximum thermal capacity of the conductor, approximately 900 amperes would flow in each of three phases. Voltage and current are required to transmit electrical power over the transmission line. A phenomenon called electromagnetic field (EMF) results from electrically charged particles which may cause effects some distance away from the line. Voltage (measured in volts or kilovolts) is the source of the electric field. Current (measured in amperes) is the source of a magnetic field. Fields drop rapidly as the distance increases from the source. The electrical effects of the 230-kV transmission line would be characterized as “corona effects” and “field effects.” Safety concerns directly relating to EMF have also been identified.

Corona Effects

Effects of corona are audible noise, visible light, radio and television interference, and photochemical oxidants. Corona effect can be described as the situation when the voltage is at high levels and the electrons are attracted to ground (at lower potential) with sufficient energy to ionize air. It is this breakdown that produces the corona. Noticeable side effects of corona are:

Audible Noise – Corona generated audible noise is generally characterized as a crackling/hissing noise, most noticeable during wet-weather conditions. There are no design-specific regulations to limit audible noise from transmission lines. Audible noise generated from the proposed 230-kV line would be indistinguishable from background noise.

Visible Light – Corona is visible as a bluish glow under conditions of darkness, and probably only with the aid of telescopic devices. Light would be difficult to detect at the operating voltage of 230 kV.

Radio and Television Interference – Corona-generated interference is most likely to affect amplitude modulation (AM) broadcast band reception at transmission line voltages of 345 kV or more. Frequency modulation (FM) broadcast band reception is rarely affected. The proposed transmission line would be constructed according to standards that minimize sources of corona, such as surface irregularities and sharp edges on suspension hardware.

Photochemical Oxidants – Corona would ionize the surrounding air and generate ozone and nitrogen oxides. The low levels of oxidants produced would not be measurable either near the line or at ground level.

Field Effects

Field effects include induced current and voltage in conducting objects near the line, spark discharge shocks, steady-state current shocks, field perception at ground level, and magnetic field.

Current and Voltage – Voltage induction and the creation of currents in long conducting objects, such as fences and pipelines, would be possible near the proposed transmission lines. Grounding practices and the availability of mitigation measures would minimize the magnetic induction effects of the line. Non-electric fences, such as those made of barbed wire directly attached to steel posts, would be adequately grounded and would not collect an electric charge. It is recommended that other types of wire fences be constructed using at least one steel post every 150 to 200 feet to ground the fence.

Spark-Discharge Shocks – If the induced voltage were sufficiently high on an ungrounded object, a spark discharge shock would occur as contact is made with the ground. At the operating voltage of 230 kV and with standard design practices, shock discharge and nuisance shocks would be unlikely.

Steady-State Current Shocks – Steady-state currents are those that flow after a person has contacted an ungrounded object, providing a path for the induced current to flow to ground. Design requirements that

reduce or eliminate induced current and voltages would help ensure steady-state current shocks would not occur.

Field Perception – When the electric field under a transmission line is sufficiently high, persons standing under or near the line may perceive hair rising on an upraised hand. At the operating voltage of 230 kV, any of electric fields from the proposed line should not be perceived.

Safety Concerns Related to Electric and Magnetic Field (EMF)

Safety concerns have been identified with regard to field effects. These effects are generally related to the EMF surrounding transmission lines. It is not known if any EMF levels are unsafe. Some non-governmental organizations have set advisory limits as a precautionary measure, based on the knowledge that high field levels (more than 1000 times the EMF found in typical environments) may induce currents in cells or nerve stimulation. The International Commission on Non-Ionizing Radiation Protection has established a continuous, magnetic field exposure limit of 0.833 Gauss(G), or 833 milliGauss (mG), and a continuous electric field exposure limit of 4.2 kilovolts per meter (kV/m) for members of the general public. The American Council of Governmental Industrial Hygienists publishes Threshold Limit Values (TLVs) for various physical agents. The TLV for occupational exposure to 60 Hz magnetic fields has been set as 10 G (10,000 mG) and 25 kV/m for electric fields.

The earth's fields are static, or 0 Hz frequency. The earth's magnetic field is about 500 mG. The earth's electric field is about 100 V/m, but thunderstorms can temporarily increase the field in a given location to several thousand V/m. In the home, in addition to the earth's natural fields, there are power frequency fields (60Hz). All electric appliances produce electric and magnetic fields having a frequency of 60 Hz (Table 3-4). The fields are greatest closest to the surface of the cord and appliance, and drop rapidly in just a short distance. The average household background 60 Hz magnetic field is about 1 to 2 mG. The average background 60 Hz electric field is 1 to 20 V/m.

All overhead lines produce fields. The fields are usually the highest directly under the lines and fall rapidly with distance to the sides of the line. Actual field strengths would vary depending on the height of the conductors from the point of measurement. Electric fields from power lines are relatively stable because voltage does not change. Magnetic fields fluctuate greatly as current changes in response to changing load. The magnetic fields in Table 3-5 were calculated for a population of 321 power lines using 1990 mean loads.

TABLE 3-4
Typical 60 Hz Magnetic Field Levels From Common Home Appliances
 (where available)

Appliance	Magnetic Field 6 Inches from Appliance (mG)	Magnetic Field 2 Feet Away (mG)
Electric Shaver	100	-
Vacuum Cleaner	300	10
Electric Oven	9	-
Dishwasher	20	4
Microwave Oven	200	10
Hair Dryer	300	-
Computers	14	2
Fluorescent Lights	40	2
Facsimile Machines	6	-
Copy Machines	90	7
Garbage Disposals	80	2

TABLE 3-5
Typical 60 Hz Electric and Magnetic Field Levels From Overhead Powerlines

Voltage of Line	Centerline	Approx. Edge of Right of Way	100 feet	200 feet	300 feet
115 kV					
Electric Field kV/m	1.0	0.5	0.07	0.01	0.003
Magnetic Field mG	30	6.5	1.7	0.4	0.2
230 kV					
Electric Field kV/m	2.0	1.5	0.3	0.05	0.01
Magnetic Field mG	57.5	19.5	7.1	1.8	0.8
500 kV					
Electric Field kV/m	7.0	3.0	1.0	0.3	0.1
Magnetic Field mG	86.7	29.4	12.6	3.2	1.4

Magnetic fields at the edge of ROW (25 feet from centerline) at maximum line capacity are calculated to be 7.4 mG. At a distance of 50 feet from the centerline, the maximum fields would be less than 2 mG. It is unlikely that exposures to the electric and magnetic fields from the proposed line would have adverse effects on biological systems, based on the low levels of magnetic fields from the proposed line and the fact that the proposed line would not be located near a residential area. Electric fields would be less than one kV/m and no significant adverse impacts are anticipated.

In the June, 2005 British Medical Journal, Draper, Vincent, Kroll and Swanson's paper *Childhood cancer in relation to distance from high voltage power lines in England and Wales: a case-control study*

reported on the risk of childhood leukemia in relationship to their home address when born. Compared with those who lived greater than 600 meters from a transmission line at birth, children who lived within 200 meters had a relative risk of 1.69. Those between 200 and 600 meters had a relative risk of 1.23. The researchers reported “there is no accepted biological mechanism to explain the epidemiological results; indeed the relation may be due to chance or confounding.”

No Federal regulations have established environmental limits on the strengths of fields from power lines. There are no established limits for fields in North Dakota. The state of Florida limits the magnetic field to less than 150 mG at the edge of the right-of-way for 69 to 230 kV transmission lines. The state of New York limits the magnetic field to less than 200 mG at the edge of the right-of-way. The states of Florida, Minnesota, Montana, New York, and Oregon set limits of between 7 and 11 kV/m electric field strength at the edge of the right-of-way.

Underground Collection System

Placement and care of underground power transmission lines comes with inherent risks. Lines may be cut or contacted by others digging in or across the proposed utility corridors. Underground utility locations would be identified with appropriate signage in the project area. Above ground utilities may also require signage with maximum vehicle height designations. The National Electric Safety Code (NESC) publishes recommended safety requirements for transmission systems. Recommended clearances within the NESC consider a relative vehicle height of 14 feet. Proper planning and adherence to safety regulations would ensure that no significant adverse impacts to safety as a result of the collection system occur.

Safety Issues Related to Increased Traffic during Construction

Motor vehicle traffic near the project area would temporarily increase during the construction phase as contractors working in the area establish the new power generation system. Traffic management and control of the local roadways would be considered in the forward planning and implementation of the Proposed Action. With these measures, the potential for a traffic fatality is low; consequently, an increase in risk to local residents or an increase in injuries and fatalities related to traffic is not anticipated.

In summary, with consideration during siting of the Proposed Action (avoidance), and implementation of proper mitigations as required by Western’s construction standards, OSHA, and other regulatory agencies, there would be no significant impacts to human safety and health resulting from the Proposed Action.

CULTURAL RESOURCES

Cultural resources include archaeological and historical sites, buildings, structures, and objects of historic, scientific, social value, or places of spiritual and cultural significance. The primary legislation that mandates Federal management and protection of cultural resources is the National Historic Preservation Act (NHPA) of 1966 (as amended in 1976, 1980, and 1992), specifically Section 106 of the act. For the purpose of 106 compliance, properties are considered significant if they meet the criteria for listing on the National Register of Historic Places (NRHP) (36 CFR part 60). Western is responsible for Section 106 consultation with the NDSHPO and interested public and tribes.

Cultural Background

The cultural history, from an archaeological perspective, of the region surrounding the project area extends back approximately 12,000 years. A prehistoric and protohistoric summary of the area follows:

Paleo-Indian Tradition (ca. 9500 – 5500 BC) – This is the earliest convincingly documented period of human occupation in North America. Known Paleo-Indian materials in the region consist primarily of surface finds of dateable artifacts such as projectile points (State Historical Society of North Dakota 1990).

Plains Archaic Tradition (ca. 550 BC – AD 1700) – This tradition is marked by a shift in overall subsistence strategies, increased diversity, and regionalization of projectile point styles. Cultural materials and sites from this period are quite common within the James River Study Unit (State Historical Society of North Dakota 1990).

Plains Village Tradition (ca. AD 1000 – 1780) – This tradition is marked by a subsistence strategy using both hunting and gathering and small-scale, primarily corn-based agriculture.

Equestrian Nomadic Tradition (ca. post-1720) – This tradition is marked by the introduction of horses and goods of European manufacture to indigenous cultural groups. Commonly termed the “protohistoric” period, this is the period when native peoples began to come under the influence of European culture without necessarily coming into direct contact with Europeans.

Like most other places in the interior of North America, the earliest historic activity (marked by direct contact between Native Americans and Europeans) in North Dakota was connected with the fur trade. A partial list of Native American tribes known or suspected to have inhabited the general area in

protohistoric or historic times would include: the Nakota (Yankton and Yanktonai, or Middle Sioux), Lakota (Teton or Western Sioux), Dakota (Santee, Woodland, or Eastern Sioux), Cheyenne, Hidatsa, Assiniboine, Mandan, Arikara, Plains Ojibwa, and Crow (State Historical Society of North Dakota 1990; Wilkins and Wilkins 1977; Lowie 1963).

Existing Environment

Metcalf Archaeological Consultants were contracted to conduct a Class III cultural resource inventory for the Proposed Action (Stine, 2005). The investigation involved an inventory of all proposed facilities associated with the initial phase of the Proposed Action, including the initial 33 turbines and associated collection lines, the collection substation, the new 230-kV transmission line, the temporary tap, the switching station for Option C and portions of options A and B, and access roads to serve all these facilities.

The expansion turbines and associated access roads and collection lines, as well as remaining portions of the switching station options A and B, have not yet been inventoried. Class III surveys and consultation would be completed prior to conducting any ground-disturbing activities for these additional areas.

The results of the inventory for the initial phase noted above revealed three prehistoric sites, three isolated finds and one historic site within the project area. The prehistoric sites and isolated finds were sparse lithic scatters. The prehistoric sites have not been formally evaluated for NRHP eligibility; however, given their sparse nature, none of the sites are likely eligible (Stine 2005).

The only historic site within the survey area is an active railroad (32BL541) that was formerly part of the Soo Line built in the early 1900s. The site was recorded by L. Hafermehl in 2004 and is part of Dakota, Missouri Valley and Western Railroad, Inc. The site was recommended as not eligible for the NRHP.

Environmental Consequences

A significant impact to cultural resources would occur if a site of archaeological, tribal, or historical value that is listed, or eligible for listing, by the National Register could not be avoided or mitigated during siting or construction of the Proposed Action.

Upon completion of the cultural resource inventory for the initial phase, it was determined that two of the proposed turbine sites may potentially disturb two of the prehistoric lithic scatter sites. As a result of these findings, these proposed turbine sites have been relocated to avoid these sites. Consultation with NDSHPO and interested tribes supported this concept. Additional Class III cultural inventories and

consultation would be completed prior to the second phase of the Proposed Action. Turbines, collection lines, roads, and the permanent substation location would be designed and sited to avoid cultural resources.

As discussed in Chapter 2, gravel would be used for upgrading and developing roads in the project area. The gravel used for the Proposed Action would come from gravel pits that have already been investigated and cleared by the NDSHPO. If a gravel pit were to be used that has not been cleared by NDSHPO, that site would be inventoried and NDSHPO and interested public and tribes would be consulted prior to its use. The same would be true of any soils required for fill at any facility location associated with the Proposed Action.

Additional mitigation, if required, would be developed in consultation with the NDSHPO and other interested parties and may include treatment of all known sites, those discovered during pre-construction surveys and those discovered during construction or maintenance activities. If historic or prehistoric materials are discovered during monitoring of earth-disturbing construction activities, construction would be halted and Western would be notified in order to initiate procedures outlined in 36 CFR Part 800. These procedures would include evaluating the find for eligibility and determining appropriate treatment with the NDSHPO and the North Dakota Intertribal Reinternment Committee (NDIRC).

NATIVE AMERICAN RELIGIOUS CONCERNS

In addition to NEPA, NHPA, and DOE American Indian and Alaska Native tribal consultation policy (DOE 2000), other regulations that pertain to consideration of Native American religious concerns include the American Indian Religious Freedom Act (AIRFA) and the Native American Graves Protection and Repatriation Act (NAGPRA). AIRFA provides that agencies consider the effects of their actions on Native American religious practices. NAGPRA provides that if native human remains, funerary objects, sacred objects, and objects of cultural patrimony are found on Federal land, the Federal agency (Western) is responsible for disposition of these remains and objects. This can include tribal consultation to identify potential affiliation and repatriation needs. NHPA, AIRFA, and NAGPRA all mandate consultation with affected native groups.

Existing Environment

Research of cultural resources (discussed in greater detail in the Cultural Resources section) indicates that Native Americans who inhabited the region throughout prehistoric and historic times typified the culture of the North American Plains Indians. Subsistence was focused on hunting, gathering, and small-scale agriculture. However, Native American hunting parties likely frequented uplands including the site of the proposed Burleigh County Wind Energy Center.

Metis Cultural Resource Consultants conducted a survey of traditional cultural properties within the immediate vicinity of both phases of the Proposed Action (Ferris and Nadeau 2005). This survey was conducted to identify the existence of traditional cultural properties within the project area that would be directly impacted by project implementation and in locations within the area of potential effect (APE) that may be secondarily affected (i.e. viewshed, changing land use, etc.). The results of this survey identified several stone circles and rock cairns, including potential burial sites. The report recommended avoidance of these sites.

In addition, consultation has been initiated with the NDIRC, which represents collective tribal interests in North Dakota on issues related to sacred sites (State Historical Society of North Dakota 1990). This consultation would be ongoing throughout planning and construction of the Proposed Action, including addressing comments to the EA and meeting with tribes.

Environmental Consequences

A significant impact would occur if the Proposed Action caused an unmitigated, adverse effect to a traditional cultural property (TCP) or a burial site. Western entered into a Memorandum of Agreement (MOA) with the NDIRC during 1996 to ensure that provisions of NAGPRA are addressed on lands owned and/or managed by Western. To mitigate the potential for significant effects from activities associated with the Proposed Action, Western would address any concerns expressed by the NDIRC during the course of Proposed Action planning and construction in accordance with the terms of the MOA.

Siting and construction of the Proposed Action would be subject to the following North Dakota laws: *Protection of Human Burial Sites, Human Remains and Burial Goods* (ND Century Code §23-06-27) and *Protection of Prehistoric Sites and Deposits* (ND Century Code §55-03, *et seq.*). As a result, Western would notify the appropriate individuals, agencies, and authorities in accordance with these laws and the

NDIRC MOA in the event that important cultural or historic resources are discovered during inventories or construction associated with the Proposed Action.

TCPs were identified within the survey area. Project planning, however, has and would continue to consider and avoid these sites. If burials or cultural sites with Native American religious values are identified during construction of the Proposed Action, work would halt within 200 feet of the site until Native Americans are notified and consulted about mitigation measures.

Consultations between Western and interested tribes would continue and recommendations resulting from these consultations would be considered and implemented to the extent practicable. Burleigh County Wind, in cooperation with Native American representatives and agreements with landowners, would also implement additional measures and agreements to protect these resources.

NO ACTION

Under the no action alternative, no aspect of the project would be built. Western would continue to operate and maintain the Garrison to Bismarck Transmission Line and associated facilities.

As a result, environmental impacts from construction and maintenance associated with the Proposed Action would not occur. Most environmental conditions, as described in the Affected Environment, would be expected to persist in their existing dynamic state. The need for renewable energy would not be satisfied in part by construction of the project.

CUMULATIVE EFFECTS

Cumulative effects would result from impacts of the proposed Burleigh County Wind Energy Center when added to other past, present, and reasonably foreseeable future actions occurring in the region. Significant cumulative impacts would result if impacts from the Proposed Action, when added to other actions in the region, resulted in one or more significant impacts as defined for each resource area analyzed in this chapter.

PAST AND PRESENT

Agriculture practices; vehicle travel along township, county, state, and Federal roadways; railroad operation and use; and operation of existing electrical transmission lines are the primary activities that have occurred and are occurring in the project area and generally in the region. The cumulative effects of the proposed Burleigh County Wind Energy Center would be to wildlife when added to these past and present activities.

Impacts to wildlife caused by implementing the Proposed Action would be the direct mortality of avian species, including waterfowl, upland birds, and raptors, from collisions with wind turbines or transmission lines. This anticipated increase in avian mortality would be additive to existing causes of impacts to wildlife from the aforementioned activities (i.e., human disturbance, vehicle collisions, and transmission line collisions and electrocutions), as well as natural predation, disease, and hunting. Although few data exist regarding wind generation project-caused wildlife mortality, Western expects that cumulative effects of the proposed Burleigh County Wind Energy Center and existing conditions would have little effect on wildlife populations in the area. Therefore, no significant cumulative impacts for wildlife would occur.

REASONABLY FORSEEABLE FUTURE ACTION

No reasonably foreseeable development scenario has been identified at this time. The potential for additional wind energy development does remain in the area; however, there are no known projects planned by Burleigh County Wind or others in the immediate area.

CHAPTER 4

AGENCIES CONTACTED/CONSULTED

FEDERAL AGENCIES

Federal Aviation Administration

U.S. Army Corps of Engineers

U.S. Fish and Wildlife Service

U.S. Department of Agriculture – Farm Service Agency

U.S. Department of Agriculture – Natural Resources Conservation Service

U.S. Geological Survey

Occupational Safety and Health Administration

STATE AND LOCAL AGENCIES

Burleigh County Board of County Commissioners

Burleigh County, Ecklund, and Ghylin Township Boards

North Dakota Aeronautics Commission

North Dakota Department of Health, Division of Air Quality

North Dakota Department of Health, Division of Water Quality

North Dakota Department of Transportation

North Dakota Indian Affairs Commission

North Dakota Parks and Recreation Department

North Dakota Public Service Commission

North Dakota State Historic Preservation Office

North Dakota State Land Department

North Dakota State Water Commission

NATIVE AMERICAN TRIBES AND RELATED BODIES

Northern Cheyenne Tribe

North Dakota Intertribal Reinternment Committee

Sisseton-Wahpeton Oyate

Spirit Lake Nation

Standing Rock Sioux Tribe

Three Affiliated Tribes

Turtle Mountain Band of Chippewa Indians

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