

4.0 Affected Environment and Environmental Consequences

Resources addressed in this chapter are specifically those that could be directly affected by construction, operation, maintenance, or decommissioning of BEPC's proposed Williston to Tioga Transmission Line. Significance criteria were compiled from NDPSC Routing Criteria (NDCC Title 49) (refer to section 3.1); mitigation measures have been developed from best management practices and mitigation measures provided by Western and BEPC. Mitigation measures also reflected comments received from Federal and State resource management agencies during the scoping process. Analyses address the preferred transmission line route (Route Option C), two optional transmission line routes (Route Options A and B), and the No Action Alternative. Applicable mitigation measures are listed in **Appendix D**, Project-specific Mitigation Measures.

The proposed Williston – Tioga Transmission Line would interconnect at Western's Williston Substation. Modifications to the substation would be made as were addressed in the Wolf Point to Williston Transmission Line Rebuild EA (prepared August 2003) and would consist of modifications to the 230-kV bay. Substation modifications would be entirely within the existing footprint. Western's alternatives are to permit the Williston Substation interconnection, or selection of the No Action Alternative, which would preclude the interconnection. Selection of the No Action Alternative would require BEPC to modify its Proposed Project, or consider meeting its needs in some other manner. BEPC's transmission line routing included consideration of the preferred route and two optional routes. Transmission line routing is regulated by the NDPSC for this BEPC project, and is not a Federal action.

4.1 Jurisdictions, Land Use, and Agricultural Practices

The Project area is rural and sparsely populated. Route Options A, B, and C originate in the vicinity of Williston and terminate near Tioga. Alternative C (Preferred Route Option) lies relatively close to Ray, North Dakota. All of the Route Options are in Williams County except for the extreme eastern ends, which enter western Mountrail County.

4.1.1 Affected Environment

As shown in **table 4-1**, all of the proposed Route Options would primarily cross cropland and pasture/rangeland. Construction of Route Options A and B would result in temporary impacts to approximately 132 and 115 acres of croplands, respectively. Construction of Route Options C (Preferred Route Option) would result in temporary impacts to approximately 154 acres of cropland. Croplands crossed are scattered throughout the Project area and consist of wheat, lentils, barley, oats, dry edible beans and peas, and sugar beets. Developed lands along Alternative C (Preferred Route Option) are limited to lands that are within the city limits of Ray, North Dakota. Those lands are occupied by the municipal wastewater treatment facility.

4.1.2 Environmental Consequences

Construction and operation of the Williston – Tioga Transmission Line would result in temporary and permanent impacts to land uses that would affect agricultural production in the area.

Significance Criteria

- Significant impacts would result from non-compliance with local zoning regulations.
- A significant impact would result from routing a proposed transmission line through a state-designated exclusion area.

Table 4-1 Temporary Impacts to Land Uses (acres)

	Route Option A	Route Option B	Route Option C (Preferred)
Planted herbaceous perennials	15.3	17.0	21.9
Cropland	131.9	114.6	154.2
Pasture/Rangeland	91.2	98.0	81.8
Shrubland and Barren Land	4.3	4.2	8.0
Woodland	1.7	0.5	0.6
Wetland and Riverine*	9.4	8.3	3.5
Commercial/Industrial/Developed	- 0 -	- 0 -	1.8
Total Acres (refer to table 3-2)	253.8	242.6	271.8

*Wetlands and riverine resources would be spanned, direct impacts to wetlands and riverine resources are not anticipated.

4.1.2.1 Proposed Transmission Line and Route Options

Construction of the proposed transmission line would result in temporary impacts to lands during and immediately following construction. Tangent structures and angle structures would be single-pole self supporting and would not require guy wires and anchors. Although self-supporting angle structures would require reinforced concrete and steel foundations and would be more expensive to install, additional lands that would be required for guy wires would not be needed. Since guy wires are not needed, cultivation can take place adjacent to the base of each structure; therefore, the amount of non-tillable lands would be limited to the footprint of each structure base. The absence of guy wires also would reduce potential interference with farm equipment operations near the structures and reduce maintenance requirements.

Transmission line construction would temporarily impact approximately four acres (Route Options B) to eight acres (Route Option C) of deciduous shrubland and barren land. Wetlands and riverine resources that are located along the alternative routes would be either avoided or spanned. Furthermore, most wetlands are of marginal quality due to disturbance from livestock grazing and are classified as seasonal and semipermanent palustrine. Woodlands have been avoided to the extent practicable; however construction would temporarily affect 0.5 to 1.7 acres of woodland habitat. Woodlands that would be affected by Project construction are limited to isolated pockets that are frequently associated with property boundaries, fence lines, and drainages. Shelter belts have been avoided to the extent practicable. Construction of the proposed Project would result in temporary impacts to two acres of developed lands within Route Option C; developed lands are not present within Route Options A or B.

Temporary and permanent impacts to land uses have been tabulated using analyses presented in chapter 3.0 and summarized in **table 3-2**. As shown in **table 3-2**, construction of Route Options A, B, and C would result in temporary impacts to 243 to 273 acres required for access trails between structures, structure pads (work sites), pulling and tensioning sites for conductor stringing, and conductor splicing sites.

Temporary impacts to cropland would total approximately 115 to 154 acres; temporary impacts to pastureland/rangeland would total 82 to 98 acres. Where practical, construction activities will be scheduled during periods when agricultural activities would be minimally affected, such as post-harvest periods. Therefore, impacts to croplands would be limited to soil compaction, which would be minimized by cultivation. Construction within pasturelands also could result in soil compaction, which is expected to recover over time. Wetlands and riverine areas would be either avoided or spanned during construction. Impacts to wetlands are not anticipated.

Construction of Route Option C would result in temporary impacts to approximately 1.8 acres of lands that were classified as commercial/industrial/developed. Those lands are located near the Ray, North Dakota wastewater treatment facility.

Permanent impacts would affect a total of less than 0.2 acre of various land uses, primarily cropland and pasture/rangeland, regardless of route option alternative. Overall temporary and permanent impacts would be minimized by BEPC's decision to use single-pole, self-supporting structures, rather than guyed structures or H-frame structures.

A Conditional Use Permit has been obtained from Williams County. Permits are not required from Mountrail County. The Project would be in compliance with county zoning requirements and state-designated siting criteria.

4.1.2.2 No Action Alternative

Selection of the No Action Alternative would result in a failure to meet the Project purpose and need; there would be no temporary or permanent land use impacts. If the Williston to Tioga line were not constructed, BEPC would be required to transfer needed power from a different source, as BEPC has electrical load growth responsibility under law as a regulated utility. Transferring power from a different source might necessitate construction of other transmission lines that would be longer and/or result in greater environmental impacts than those expected for the proposed Project.

4.2 Physiography, Geology, Soils, and Minerals

BEPC's construction activities could result in temporarily increased erosion potential that could affect receiving waters. Long-term impacts would result from a lack of opportunity to extract minerals from local sources, if the proposed Project were to reduce or inhibit access to mineral resource areas.

4.2.1 Affected Environment

The Project area is gently rolling terrain that is crossed by well-defined streams and drainages. Project area elevation ranges from 1,877 feet amsl in the vicinity of Williston to 2,244 feet amsl near Tioga. Central Project area lands are largely drained by the Little Muddy Creek and its tributaries, which flow in a southerly direction to the Missouri River and Lake Sakakawea.

4.2.1.1 Physiography

The proposed Project is located in the Great Plains physiographic province (Fenneman 1928). In western North Dakota, the Great Plains is divided into two major sections, the Glaciated Missouri Plateau and the Unglaciated Missouri Plateau. The Missouri Plateau is essentially a dissected plateau characterized by badlands, buttes and mesas, and exhumed mountain ranges such as the Black Hills. The proposed route is in the Glaciated Missouri Plateau. The glaciated area is generally of low relief compared to the unglaciated area which has more variety of landforms (Trimble 1980). The Glaciated Missouri Plateau is covered by glacial deposits, but the boundary between the glaciated and non-glaciated sections is not distinct because the glacial deposits thin gradually.

4.2.1.2 Geology

Surficial deposits are primarily composed of Quaternary alluvium and colluvium and glacial till (Freers 1970). The alluvium occurs in the Muddy Creek alluvial valley. Glacial material consists of a variety of moraine deposits including ground moraines, dead ice moraines, and lake deposits. The surficial material is largely composed of sand, gravel, and clay.

The bedrock geology consists of Tertiary Bullion Creek and Sentinel Butte Formations of the Fort Union Group (Bluemle 1988). These formations are largely composed of claystone, siltstone, sandstone, and lignite. There are very few exposures of bedrock in the Project area, it being mostly covered by glacially derived surficial deposits (Freers 1970). The bedrock is mainly exposed along the Missouri River south of the Project area.

The Project area is located in the Williston Basin, a major structural basin that covers northeastern Montana, most of North Dakota, and northwestern South Dakota (Peterson and MacCary 1987). The Williston Basin also extends north into Saskatchewan and Manitoba in southern Canada. The basin contains about 15,000 feet of Paleozoic through Tertiary sedimentary rock. The center of the basin is located south of the Project area in McKenzie County and the rocks dip gently to the south. The major structural feature in the Project area is the Nessen Anticline, a north-south trending structure located in eastern Williams County, extending for 75 miles south from the Canadian border to eastern McKenzie County (Gerhard et al. 1987). North-south trending fault zones paralleling the Nessen Anticline have been mapped in the deeper bedrock in Williams County, but do not extend up to the surface.

4.2.1.3 Soils

BEPC's proposed Williston to Tioga Transmission Line is within the Central and Northern Dark Brown Glaciated Plains Major Land Resource Areas (MLRA's) (Soils Survey Geographic database [SSURGO] 2008). The Central and Northern Dark Brown Glaciated Plains consists of nearly level to rolling till plains that are interrupted by more strongly rolling slopes adjacent to kettle holes, kames, moraines, and small glacial lakes. Deep, clayey to loamy soils dominate the landscape; these typically have thick, dark, and organically enriched topsoil layers. Mollisols and Inceptisols are the dominant soil orders in the MLRAs. Soils in the study area primarily support grazing and dryland crops.

Data have been compiled from the NRCS to indicate those soils that are prone to compaction, are classified as hydric, have low revegetation potential, and those that are classified as subject to severe wind and water erosion.

The NRCS defines a hydric soil as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils are commonly associated with floodplains, lake plains, basin plains, and with riparian areas, wetlands, springs, and seeps.

Soils in the area have a high revegetation potential and only a few soils in the area are subject to severe wind or water erosion potential. Soil erosion would be accelerated if disturbed. Disturbance is characterized as removing the protective litter, or vegetative cover. None of the soils crossed are shallow to lithic (hard) bedrock.

Prime Farmland

Prime farmland is characterized as the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops available for these uses. The land could be cropland, pastureland, rangeland, forest land, or other land, but not urban or built-up land or water areas. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner when treated and managed, including water management, according to acceptable farming methods. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable levels of acidity or alkalinity, an acceptable content of salt and sodium, and few or no rocks. They have soils that are permeable to water and air. Prime farmland is neither excessively erodible nor saturated with water for a long period of time, and it either does not flood frequently, or is protected from flooding (NRCS 2007).

Specific technical criteria were established by Congress to identify prime farmland soils. In general, criteria reflect adequate natural moisture content; specific soil temperature range; pH between 4.5 and 8.4 in the rooting zone; low susceptibility to flooding; low risk to wind and water erosion; minimum permeability rates; and low rock fragment content (NRCS 2007).

Unique Farmland

Unique farmland is defined by the NRCS as land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil qualities, location, growing

season, and moisture supply needed for the economic production of sustained high yields of a specific high-value crop when treated and managed by acceptable farming methods (NRCS 2007).

Farmland of Statewide Importance

Farmland of Statewide Importance is determined by North Dakota State agencies. Some areas other than areas of prime and unique farmland are of statewide importance in the production of food, feed, fiber, forage, and oilseed crops. The criteria used in defining and delineating these areas are determined by the appropriate State agency or agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed by acceptable farming methods. Some areas can produce as high a yield as prime farmland if conditions are favorable. Additional farmland of statewide importance may include tracts of land that have been designated for agriculture by State law (NRCS 2007).

4.2.1.4 Mineral Resources

The major energy mineral resources in the Project area are oil, natural gas, and lignite (Freers 1970). Important non-fuel mineral resources are sand and gravel, clay, salt (halite), and scoria. The Williston Basin is a major oil and gas producing basin. In the U.S.-portion of the basin, total production from 1951 to the end of 2007 was approximately 2.5 billion barrels of oil and 470 billion cubic feet of gas (Burke 2006; Montana Board of Oil and Gas 2007; North Dakota Industrial Commission 2007; South Dakota Oil and Gas Section 2008). The first commercial oil well in North Dakota was drilled in Williams County on the Nessen Anticline in 1951, about seven miles south of Tioga (Freers 1970). Oil production decline in the 1990s has been offset in recent years by technological advances that have resulted in increased production from the Bakken Formation which has an estimated mean technically recoverable resource of 3.7 billion barrels of oil and 1.9 trillion cubic feet of gas (USGS 2008a). **Table 4-2** lists abandoned lignite mines that are within 1,320 feet of the Preferred Optional Route. There are no active mines within 1,320 feet of the Preferred Optional Route C.

Table 4-2 Abandoned Lignite Mines in Project Area¹

Mine Name	Location	Dates of Operation
Eby	T154N, R101W, SW ¼ 5	Not known
Peterson	T154N, R101W, SW ¼ 5	1921-1926
Head	T154N, R101W, SE ¼ 7	1910-1916(?)
Union	T154N, R101W, SW ¼ 8	1920s
Nichols	T154N, R101W, SW ¼ NE ¼ 8	1920s

Source: North Dakota Abandoned Mined Lands Division (2006).

The Project area is located in the Fort Union Coal region (Averitt 1972). Coal in the Fort Union Formation is generally lignite in the Project area. The Fort Union Group in Williams County contains at least six important lignite beds that have been mined (Freers 1970). Lignite has been mined in Williams County for many years. Before modern surface mining methods were employed (stripping off the overburden, backfilling, and reclamation), lignite was mined by room-and-pillar underground methods. Because the overburden was thin (often less than 50 feet), underground voids would collapse to the surface creating sinkhole-type subsidence, fissures, and unstable ground conditions. Several abandoned lignite mines are present in the study area and an active underground mine remediation is underway west of Williston, North Dakota (North Dakota Abandoned Mined Lands Division 2006) (Dodd 2008a). The abandoned lignite mine sites of record are listed on **table 4-2** and are adjacent or under the Route Options A and C.

The mines listed were all operated and abandoned over 70 years ago. The abandoned mine database (North Dakota Mined Land Reclamation Division 2006) indicates that the exact locations and extent of abandoned

mine workings were not determined with certainty, but are approximate locations based on the best historical information available.

Sinkholes have developed in areas located in Sections 5 and 7, Township 154 North (T154N), Range 101 West (R101W) and the North Dakota Mined Land Reclamation Division (Dodd 2008b) has documented the precise locations and, in some cases, dimensions of the sinkholes. The information is provided in **table 4-3**.

Table 4-3 Sinkhole Data

Section, Township, Range	Latitude/Longitude	Length (feet)	Width (feet)	Diameter (feet)	Depth (feet)
5, T154N, R101W	48.18342/103.71127	25	18	ND	8
	near previous coordinates	ND	ND	6	3
	48.18453/103.71169	ND	ND	30	6
	near previous coordinates	ND	ND	15	4
7, T154N, R101W	48.17616/103.71737	20	15	ND	6
	48.17629/103.71711	12	4	ND	4
	48.17573/103.7177	ND	ND	12	4
	48.17584 103.71559	ND	ND	6	3

ND = No Data Available.

Source: Dodd (2008b).

Aggregate (sand and gravel) production is from localized deposits in floodplains or glacial deposits (Freers 1970). No gravel pits are located close to the Preferred Route or Route Options.

Clay deposits suitable for ceramic production are present in the Fort Union Group formations, but none is being mined currently. Another commodity is “scoria” or “clinker” that occurs when lignite beds burn and bake the shale and claystone strata next to the coal. Scoria is used for road surfacing and oil well location surfacing material (Freers 1970). No scoria pits are located near the Proposed Project.

4.2.1.5 Seismicity

There are three major phenomena associated with seismic hazards: Faults, seismicity, and ground motion. The following describes the potential for seismic hazard occurrence in the Project area.

Faults are dislocations whereby blocks of earth material on opposite sides of the faults have moved in relation to one another. Rapid slippage of blocks of earth past each other can cause energy to be released, resulting in an earthquake. There is evidence of fault offset in older strata underlying the surficial cover, but no evidence exists for movement on the faults in the last 10,000 years. No active faults have been identified in the Project area (Crone and Wheeler 2000). An active fault is one in which movement can be demonstrated to have taken place within the last 10,000 years (USGS 2008b).

Seismicity concerns the intensity, frequency, and location of earthquakes in a given area. Western North Dakota has historically little earthquake activity (USGS 2008c). From 1990 to 2006, almost no seismic events were recorded North Dakota.

Ground motion hazards result when the energy from an earthquake is propagated through the ground. The USGS ground motion hazard mapping indicates that potential ground motion hazard in the proposed Project area is low. The hazard map used estimates peak ground acceleration of 4 to 6 percent of gravity with a two percent probability of exceedence in 50 years (Frankel et al. 1997; Peterson et al. 2008).

Active faults, seismic activity, and ground motion are uncommon within the Project area. Therefore, effects on transmission line structures from such phenomena are unlikely. If unstable soil conditions are encountered during construction, BEPC would modify structure locations accordingly.

4.2.1.6 Landslides

Landslide is a term used for various processes involving the movement of earth material down slopes (USGS 2004). Landslides can occur in a number of different ways in different geological settings. Large masses of earth can become unstable and by gravity begin to move downhill. The instability can be caused by a combination of steep slopes, periods of high precipitation, undermining of support by natural processes (stream erosion), or unintentional undercutting or undermining the strength of unstable materials in the construction of roads and structures.

Landslides are present in the Project area and are mainly found in the badlands next to Lake Sakakawea and in areas adjacent to drainages. Landslides occur when headward erosion creates instability where unconsolidated glacial deposits overlie the Fort Union Group formations. Landslides are not present in the upland areas dominated by thick layers of glacial deposits. In the Project area landslides have been identified where the Preferred Route and Route Option A cross Sand Creek and its tributaries in section 6, T154N, R101W (Stanley 2004a). Landslides also have been identified on slopes north of the Preferred Route and Route Option B along Camp Creek in section 36, T156N, R101W. Another landslide area is about 0.25 mile south of Route Option B in section 16, T155N, R101W. Landslides are classified as Project Avoidance Areas. Refer to **appendix F**.

4.2.1.7 Subsidence

As described in section 4.2.1.4, there are potential subsidence hazards as a result of underground mining of lignite. Both landslides and subsidence could damage a transmission line that crosses these unstable areas.

4.2.2 Environmental Consequences

Construction and/or operation of BEPC's Williston to Tioga Transmission Line would not affect gravel and aggregate extraction and oil and gas production and the gravel and aggregate sites would be avoided or spanned during detailed transmission line routing. BEPC would avoid active oil and gas wells through detailed transmission line routing.

Significance Criteria

- Project construction and operation would result in temporary and permanent impacts to prime and unique farmland and farmland of State-wide importance. Those impacts would be significant if they were to result in the inability of individual landowners to remain economically viable.
- Loss of access to aggregate or other minerals that would reduce the economic viability of the local communities would represent a significant impact.
- Permanent impacts due to rutting and compacting.

4.2.2.1 Preferred Transmission Line Route and Route Options

Boring of each 5-foot-diameter single-pole tangent structure to an average depth of 20 feet would displace approximately 15 cubic yards (393 cubic feet) of soil. Installation of turning structures (those that alter the direction of the line) would require a 6-foot-diameter, 20-foot-deep borehole for foundation construction. Soil displacement for each turning structure would total approximately 21 cubic yards (565 cubic feet). Excess soils after backfilling around the structure would be spread around each structure or disposed of off-site at an approved landfill.

Additional mitigation measures include limiting the amount of ground disturbance to the extent practicable, and the use of silt and flow barriers. BEPC's construction contractor would be responsible for a Storm Water

Pollution Prevention Plan (SWPPP); BEPC engineers and lands specialists would oversee construction to ensure compliance with SWPPP requirements and compliance with landowner requests.

Disturbance by construction practices resulting in the loss of the protective vegetative soil cover could result in accelerated wind and water erosion. Compaction may occur where construction vehicles travel along the ROW, especially if the soil is moist or wet. Temporary impacts to soils could increase erosion by wind and water. The Proposed Project would affect 8.1 to 9.8 acres of soils prone to water erosion. Route Options A and B would each affect 0.4 acre of soils prone to severe wind erosion. Soils prone to wind erosion are not found along the preferred Route Option C, so wind erosion would not be expected. Project mitigation measures and BMP's would be applied to reduce water erosion and the potential for resultant sedimentation to nearby waterways.

Displacement of soil by boring holes for structures would result in a loss of the A horizon and a reduction in long-term productivity until soil horizons form and recover, which might take decades or centuries. The mixing of soil horizons by spreading subsoil on the soil surface, would lower soil productivity of agricultural and rangeland by diluting the physical, biological, and chemical properties of the topsoil. This is especially a concern in areas of prime farmland. As previously discussed, BEPC will remove excess excavated soil to an appropriate landfill for structures located in sensitive agricultural areas to mitigate these impacts.

Rutting affects the surface hydrology of a site as well as the rooting environment, and may mix soil horizons if deep enough. The process of rutting physically severs roots and reduces the aeration and infiltration potential of the soil, thereby degrading the rooting environment. Rutting also disrupts natural surface water hydrology by damming surface water flows, creating increased soil saturation upgradient from ruts, or by diverting and concentrating water flows creating accelerated erosion.

Soil compaction and rutting would result from the movement of heavy construction vehicles along the construction ROW, on access roads, and from overland access. The degree of compaction would depend on the moisture content and texture of the soil at the time of construction. Only 2.4 acres of compaction-prone soils occur along Route Option C, while 4.3 and 8.6 acres occur along Route Options A and B, respectively. Compaction would be most severe where heavy equipment operates on moist to wet soils with high clay contents. Wet areas such as wetlands and streams can be avoided or spanned by the line to minimize impacts. Detrimental compaction also can occur on soils of various textures and moisture contents if multiple passes are made on the same area by high ground-weight equipment. If soils are moist or wet, topsoil may also adhere to tires and/or tracked vehicles and be carried away. BEPC would schedule routine maintenance of the line during periods of minimum precipitation to minimize impacts such as rutting and compaction.

When weather and ground conditions permit, all deep ruts that are hazardous to farming operations and to movement of equipment would be eliminated or compensation will be provided if the landowner desires. BEPC would level, fill, and grade, or otherwise eliminate such ruts in an approved manner. Ruts, scars, and compacted soils from construction activities in cropland or rangeland would be loosened and leveled by scarifying, harrowing, discing, or other appropriate method. Damage to ditches, terraces, roads, and other features of the land would be corrected. The land and other features will be restored by BEPC as nearly as practicable to their original conditions.

Table 4-4 indicates the soil limitations within rights-of-way by the Optional Routes. The soil assessment for the proposed Project is based on the Soil Survey Geographic (SSURGO) database (NRCS 2010) review and analyses. Field mapping methods using national standards are used to construct the soil maps in the SSURGO database. SSURGO is the most detailed level of soil mapping completed by the NRCS. SSURGO digitizing duplicates the original soil survey maps.

Table 4-4 Soil Limitations within Right-of-Way, by Route Option (acres)

	Route Option		
	A	B	C (Preferred)
Compaction Prone ¹	4.3	8.6	2.4
Hydric ²	63.1	58.5	63.4
Low Revegetation Potential	0.0	0.0	0.0
Severe Wind Erosion	0.4	0.4	0.0
Severe Water Erosion	8.7	9.8	8.1
Shallow Depth to Restrictive Layer ³	8.7	9.6	7.2

¹ Includes soils with greater than 28 percent clay in the top 20 inches.

² Soils characterized as hydric or partially hydric.

³ Paralithic bedrock.

Source: NRCS 2010.

Prime and Unique Farmlands and Farmlands of Statewide Importance

Data indicate that 3.0 to 4.8 acres of Prime and Unique Farmland and 100.5 to 126.5 acres of Farmlands of Statewide Importance would be temporarily impacted by transmission line construction. Temporary impacts to prime and unique farmland and farmlands of statewide importance are shown on **table 4-5** for the three transmission line Route Options.

Table 4-5 Temporary Impacts to Prime and Unique Farmlands and Farmlands of Statewide Importance by Route Option (acres)

	Route Option		
	A	B	C (Preferred)
Temporary Impacts to Prime and Unique Farmlands (acres)	4.8	4.1	3.0
Temporary Impacts to Farmlands of Statewide Importance (acres)	119.4	100.5	126.5
Other Lands	129.6	138.0	143.2
Total Acres Impacted (refer to table 3-2)	253.8	242.6	272.7

Impacts to Prime and Unique Farmland and Farmland of Statewide Importance would be temporary and short term during, and immediately following, construction. Construction equipment would likely result in soil compaction and/or rutting, particularly along the 12-foot-wide temporary access trail between structures and at structure work site locations where boring equipment, cranes, and trucks would be operating. Although not totally effective in all cases, most compaction and rutting would be mitigated by cultivation. Temporary impacts also could be minimized if construction were to take place during periods of low precipitation. Long-term or permanent loss of important farmlands would be limited to the small area that is expected to be occupied by transmission line structures. Installation of 363 to 401 structures would physically occupy less than 0.2 acre of land. Permanent loss of Prime and Unique Farmland and Farmland of Statewide Importance would be considerably less. Such negligible losses would not result in loss of economic viability to area farmers. The

use of self-supporting single-pole structures (rather than guyed structures or H-frame structures) would further reduce impacts to croplands by allowing cultivation to take place immediately adjacent to each structure base.

4.2.2.2 Mineral Resources

BEPC's Proposed Project would not affect minerals production within the area. Scattered aggregate excavation sites would be either avoided or spanned during detailed engineering. Oil and gas wells, primarily in the vicinity of Tioga, would be similarly avoided. Potential impacts to oil and gas production sites have been further minimized by BEPC's routing of the proposed Project along section and mid-section lines, rather than through tracts of land where such facilities are typically located.

4.3 Hydrology and Drainage

Although BEPC has avoided surface waters to the extent practicable, secondary impacts could result from sediment loading to receiving streams. Direct impacts to drainages and waterways would be avoided because they would be either avoided or spanned, and because erosion and sedimentation control structures such as bales or silt barriers would be employed where appropriate.

4.3.1 Affected Environment

The U.S. Congress passed the National Flood Insurance Act of 1968 in response to increasing losses from flood hazards nationwide, which resulted in establishing the National Flood Insurance Program (NFIP). The Act was subsequently expanded by the Flood Disaster Protection Act of 1973 in which floodplain areas and flood risk zones within the U.S. were identified as part of the Act.

The NFIP identified floodplain areas through flood insurance studies, consisting of hydrologic and hydraulic studies of flood risks which are administered by the Federal Emergency Management Agency (FEMA). FEMA prepares Flood Insurance Rate Maps that depict the spatial extent of flood hazard areas within Special Flood Hazard Areas (SFHAs). Flood hazard areas within the Project area are largely associated with the Little Muddy River and its tributaries, north of Williston. Although SFHAs have been designated to describe the potential for flooding events, those applicable to the Williston to Tioga Transmission Line Project area are limited those within the ROW and described in **table 4-6**.

Table 4-6 Special Flood Hazard Zones Applicable to the Project Area

Zone Name	Zone	Description
Zone X (500-year)	X500	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than one-foot or with drainage areas less than one-square-mile; or an area protected by levees from 100-year-flooding.
Zone AE	AE	An area inundated by 100-year flooding, for which Base Flood Elevations (BFEs) have been determined.
Zone A	A	An area inundated by 100-year flooding, for which no BFEs have been determined.

4.3.2 Environmental Consequences

Significance Criteria

- Significant impacts would result from reduced conveyance capacity of floodwaters resulting in property or crop loss (violation of Executive Order [EO] 11988) or uncontrolled contamination of surface water from erosion or storm water runoff (violation of the Clean Water Act [CWA], as amended, 33 USC 1251, et seq.

4.3.2.1 Preferred Transmission Line Route and Route Options

Waters within the Project area include scattered stock ponds and ephemeral streams. Many stock ponds and ephemeral streams have been degraded by livestock and are of limited wildlife value. Transmission line routing avoided wetlands and water features, to the extent practicable. Those that could not be fully avoided would be spanned. Areas crossed by the three transmission line route options are identified in **table 4-7**.

Table 4-7 Flood Prone Areas Crossed by Route Options (acres)

	Route Option		
	A	B	C (Preferred)
Zone X (500-year)	0.0	0.0	4.5
Zone AE	0.0	0.0	0.0
Zone A	0.0	0.0	1.0
Total Acres	0.0	0.0	5.5

Route Options A and B would not cross flood prone areas. Although Route Option C would temporarily impact approximately 5.5 acres of flood prone lands, BEPC would not place structures within flood prone areas or within streams or channels. Flood prone areas, streams, and channels would be avoided or spanned on a case-by-case basis. Access to structure locations would avoid crossing streams and channels. If streams or channels cannot be avoided, crossings would generally be perpendicular to such features. If culverts are needed, they would be installed temporarily and removed following construction activities. Silt barriers would be constructed to mitigate the potential for sediment loading from disturbed soils, as necessary. BEPC would revegetate disturbed soils promptly to mitigate sediment transport.

BEPC’s construction contractor would develop a SWPPP specifically for the Proposed Project, which would reduce the potential for off-site transport of soils and contaminants during construction. The plan would identify circumstances in which silt barriers and other containment methods would be used and steps that would be taken to restore disturbed areas.

4.4 Vegetation Resources

The Project area is primarily comprised of planted herbaceous perennials, croplands, pasture/rangeland, shrublands and barren lands, woodlands, and wetlands. The North Dakota Natural Heritage Inventory lists three Sensitive Ecological Communities that are known to be present near the preferred transmission line alignment.

4.4.1 Affected Environment

Vegetation within each Route Option was characterized from a literature review of the NDGFD Comprehensive Wildlife Conservation Strategy (Hagen et al. 2005) and augmented through field investigations completed during September 2008 and June 2009. The Proposed Project is located within the Missouri Slope region of North Dakota, which is dominated by mixed-grass prairie with shortgrass prairie in relatively high elevations. The landscape includes level to rolling plains topography. Pasture/rangelands, croplands, and planted herbaceous perennials dominate the Project area; shrublands and woodlands are in scattered locations within the proposed ROW.

4.4.1.1 Planted Herbaceous Perennials

Herbaceous perennials grow for several seasons, after which the crop is typically plowed down to provide nutrients, especially nitrogen, to the soil. Planted herbaceous perennials (primarily alfalfa) are in scattered locations within the Project area. These locations will change as local farmers plow down alfalfa fields and return them to cultivated agriculture, and rotate other cultivated fields into herbaceous perennials to “rest” the land.

4.4.1.2 Cropland/Cultivated

Croplands are one of the largest resource categories within the project area. Crop production includes peas, lentils, sunflowers, dry edible beans, sugar beets, and other commodities. These are annual crops, with the residual plant material plowed down after harvest to allow planting of the next year’s crop.

4.4.1.3 Pasture/Rangeland

Agricultural activities within the Project area have largely eliminated the presence of mixed-grass prairie and shortgrass prairie communities. Grasslands that are present are predominantly those that have been planted and are maintained for grazing. Grasslands within the Project area are described in the following text.

- **Mixed-Grass Prairie Community:** The mixed-grass prairie of North Dakota is a combination of the tallgrass species of eastern North Dakota and the shortgrass species found to the west. It is comprised of warm and cool season grasses and sedges. Common grasses include prairie junegrass (*Koeleria macrantha*), western wheatgrass (*Elymus smithii*), green needlegrass (*Nassella viridula*), needle-and-thread (*Hesperostipa comata*), blue grama (*Bouteloua gracilis*), little bluestem (*Schizachyrium scoparium*), and needleleaf sedge (*Carex duriuscula*) (Hagen et al. 2005). Other grass species include Canada wild-rye (*Elymus canadensis*), spike oats (*Helictotrichon hookeri*), mat muhly (*Muhlenburgia richardsonis*), spikemoss (*Selaginella* spp.), plains reedgrass (*Calamagrostis montanensis*), and buffalo grass (*Buchloe dactyloides*) (Hagen et al. 2005). Forbs included in the mixed-grass prairie community include pasque flower (*Pulsatilla* spp.), western wallflower (*Erysimum asperum*), prairie smoke (*Geum triflorum*), Missouri milkvetch (*Astragalus missouriensis*), lead plant (*Amorpha canescens*), Indian breadroot (*Pediomelum* spp.), purple prairie clover (*Dalea purpurea*), gaura (*Guara* spp.), harebell (*Asyneuma* spp.), fringed sage (*Artemisia frigida*), purple coneflower (*Echinacea* spp.), yarrow (*Achillea* spp.), and several species of goldenrods (*Solidago* spp.) (Hagen et al. 2005). Shortgrass prairie is included in the mixed-grass community. Common species include: spikemoss, blue grama, needleleaf sedge, threadleaf sedge (*Carex filifolia*), buffalo grass, and needle-and-thread. These species mature at 6 to 12 inches in height. Forbs include white wild onion (*Allium textile*), death camas (*Zigadenus* spp.), buffalo-bean (*Thermopsis* spp.), purple loco (*Oxytropis lambertii*), silverleaf (*Astragalus* spp.), prickly pear (*Optunia polyacantha*), moss phlox (*Phlox subulata*), white beardtongue (*Penstemon* spp.), and fringed sage (Hagen et al. 2005).
- **Planted Grassland:** Planted grassland is prairie that has been converted to cropland and then re-planted to hayland or native grasses. Conservation Reserve Program (CRP) land is a major component of this landscape. Predominant vegetation in this community includes smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*Thinopyrum intermedium*), tall wheatgrass (*Thinopyrum ponticum*), big bluestem (*Andropogon gerardii*), alfalfa (*Medicago sativa*), and sweet clover (*Melilotus* spp.) (Hagen et al. 2005).

4.4.1.4 Shrubland and Barren Lands

Shrublands and barren lands are characterized by a general absence of agriculture and human occupancy. Big sagebrush (*Artemisia tridentata*) is the dominant vegetation. Road surfaces also are classified as barren lands.

4.4.1.5 Woodlands

Woodland habitats are found in only a few locations in North Dakota, and they do not cover large contiguous areas (Hagen et al. 2005). Woodlands that are present within the state are often restricted to planted

windbreaks, shelter belts, and drainages. This characterization is true of the Project area. Dominant woody vegetation typically includes boxelder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), chokecherry (*Prunus virginiana*), and Siberian elm (*Ulmus pumila*).

- Upland Deciduous/Green Ash Forest: The dominant natural vegetation of these forests includes bur oak (*Quercus marocarpa*), green ash, quaking aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), box elder, and paper birch (*Betula papyrifera*). Shrubs associated with these forests include beaked hazel (*Corylus cornuta*), highbush cranberry (*Viburnum opulus* var. *americanum*), Juneberry (*Amelanchier alnifolia*), red raspberry (*Rubus idaeus*), and choke cherry (Hagen et al. 2005).

4.4.1.6 Wetland and Riverine

Wetland and riverine habitats are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of wetland vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory 1987). Wetlands are classified depending on how long water and vegetation are present. These range from temporary wetlands that typically hold water for only a few weeks, to permanent wetlands that hold water year round. Wetland types crossed by the Proposed Project include palustrine and riverine wetlands. Dominant vegetation of wetland areas includes fine textured grasses, sedges, and rushes (Hagen et al. 2005). Riparian areas, or wooded wetlands, are not crossed by BEPC's Proposed Project.

- Palustrine Wetlands: Palustrine wetlands include all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. They can be grouped into vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie, which are found throughout the U.S. It also includes the small, shallow, permanent or intermittent water bodies often called ponds (Cowardin et al. 1979).

Palustrine wetlands in the vicinity of the Proposed Project include seasonal, semi-permanent, and permanent subcategories. Seasonal wetlands are described as having surface water present for extended periods in spring and early summer, but usually disappear as early as midsummer (Hagen et al. 2005). Semi-permanent wetlands have water present year-round in most years but during dry years, water may disappear as early as midsummer (Hagen et al. 2005). Finally, permanent wetlands will contain water throughout the years, in all years (Hagen et al. 2005).

- Riverine Wetlands: Riverine wetlands include wetlands contained within a channel, with two exceptions: 1) wetland dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens; and 2) habitats with water containing ocean-derived salts. Water is usually, but not always, flowing in the riverine system. Upland islands or palustrine wetlands may occur in the channel but they are not included in the riverine system. The lower perennial subsystem includes waterbodies where some water flows throughout the year and the gradient is low and water velocity is slow. Substrates consist mainly of sand and mud. The intermittent subsystem includes channels where the water flows for only part of the year (Cowardin et al. 1979).

Wetland delineation surveys were conducted in September 2008. Twenty-nine wetlands and 61 waterbodies were identified along the Preferred Route. All wetlands were determined to be palustrine, as defined above. Wetland determination was based on the presence of hydrophytic vegetation, hydric soils, and wetland hydrology in accordance with the U.S. Army Corps of Engineers 3-parameter methodology.

4.4.1.7 Developed Lands

Lands that are classified as developed include areas within metropolitan jurisdictional limits and road or highway surfaces. Route Option C crosses developed lands that are associated with the Ray wastewater treatment facility.

4.4.1.8 Sensitive Ecological Communities

Sensitive ecological communities within proximity to the Preferred Route and Route Options were identified by the North Dakota Natural Heritage Inventory (NDNHI) 2008. These terrestrial communities consist of interrelated assemblages of plants, animals, other living organisms, geological substrates, and soils that are shaped by natural processes. These communities are either rare/endangered, ecologically significant, or unique to the area. Several sensitive ecological communities were identified by the NDNHI as present in the vicinity of the Preferred Route and Route Options, but not within the proposed transmission line ROW. Those communities are:

- Western Three-square Meadow;
- Needle-and-thread Mixed Grass Prairie; and
- Green Ash Upland Woodland.

The nearest sensitive ecological community is approximately 5.5 miles from the proposed transmission line.

4.4.1.9 Noxious Weeds

Several noxious weed species are known to be a problem in North Dakota. If not controlled, noxious weeds can infest areas, resulting in the loss of native grasses and forbs. Noxious weeds identified by the NRCS are listed in **table 4-8**. The list includes State and county prohibited or restricted noxious weeds that are managed and controlled by the State of North Dakota. Although a noxious weed survey was not performed within the Project area, USDA data (2009) indicate that absinth wormwood, musk thistle, spotted knapweed, field bindweed, and broomleaf toadflax are most likely to occur within the Project area.

Table 4-8 Noxious and Invasive Weeds Known to Occur in North Dakota

Common Name	Scientific Name
Russian knapweed	<i>Acroptilon repens</i>
Absinth wormwood	<i>Artemisia absinthium</i>
Musk thistle	<i>Carduus nutans</i>
Canada thistle	<i>Cirsium arvense</i>
Diffuse knapweed	<i>Centaurea diffusa</i>
Spotted knapweed	<i>Centaurea stoebe</i>
Yellow starthistle	<i>Centaurea solstitialis</i>
Field bindweed	<i>Convolvulus arvensis</i>
Leafy spurge	<i>Euphorbia esula</i>
Broomleaf toadflax	<i>Linaria genistifolia</i>
Purple loosestrife	<i>Lythrum salicaria, L. virgatum</i>
Saltcedar	<i>Tamarix chinensis, T. ramosissima</i>

Source: NRCS 2008.

4.4.2 Environmental Consequences

Impact analyses focused on plant communities within the Project area that may be affected by constructing and operating the Proposed Project. Methods included reviewing published literature, North Dakota Natural Heritage database information, internet websites, agency correspondence, and results of baseline biological surveys conducted during April and September 2008.

Significance Criteria

- Vegetation Resources: Habitat alteration, soil compaction, and surface disturbance resulting in the loss or decline in native plant species or their associated habitat would represent a significant impact.
- Loss of any plant population that would result in a species being listed or proposed for listing as threatened or endangered would represent a significant impact.
- Sensitive Ecological Communities: Loss of native communities identified by a State or Federal agency would represent a significant impact.
- Noxious Weeds: Significant impacts would result from the introduction of, and lack of control of noxious weeds.

Vegetation types that would be temporarily disturbed, reduced, and removed as a result of BEPC’s construction and installation of the transmission line (i.e., structure work areas, access trails, splicing sites, pulling and tensioning areas, laydown areas) are provided in **table 4-9**. Estimated acreages of temporary impacts to vegetation communities have been calculated using total acreage disturbances by Route Option as presented in **table 3-2**.

Table 4-9 Temporary Impacts to Vegetation Resources by Route Option (acres)

Vegetation Community	Vegetation Sub-community	Route Option		
		A	B	C (Preferred)
Planted Herbaceous Perennials	Planted Herbaceous Perennials	15.3	17.0	21.4
Cultivated	Cropland	131.9	114.6	153.2
Pasture/Rangeland	Mixed Bluestem, Needlegrass, & Wheatgrass	86.5	86.0	70.4
	Planted Grasses	4.7	12.0	13.9
	Total Pasture/Rangeland	91.2	98.0	84.3
Shrubland & Barren Lands	Total Shrubland & Barren Land	4.3	4.2	8.3
Woodlands	Total Woodlands	1.7	0.5	0.9
Wetlands and Riverine	Total Wetlands	9.4	8.3	2.8
Developed Lands	Total Developed Lands	0.0	0.0	1.8
Total Acres Impacted (refer to table 3-2)		253.8	242.6	272.7

BEPC’s construction of the Proposed Project would likely result in vegetation losses due to crushing by heavy equipment. Upon completion of construction, BEPC would revegetate disturbed areas in compliance with Project mitigation measures (**appendix D**), including re-seeding of disturbed areas using native vegetation, or a seed mixture that would be determined by the landowner. In addition, BEPC’s mitigation measures for vegetation and noxious weeds state that they will use standard construction practices to minimize potential soil compaction, erosion, and sedimentation associated with construction of the transmission line. Timely stabilization of areas disturbed by construction and reseeding with an appropriate seed mix would minimize the magnitude and duration of vegetation disturbance.

- **Planted Herbaceous Perennials:** Construction of the Proposed Project during the growing season would directly impact herbaceous perennials due to equipment movement for structure installation, conductor pulling and tensioning, and splicing. Construction would not take place during extremely wet conditions to reduce the possibility of soil compaction and rutting. Construction of the Project would temporarily impact 15 to 21 acres of herbaceous perennial cropland.
- **Cultivated Cropland:** Cropland would typically regenerate quickly following construction. Project mitigation measures (**appendix D**) indicate that in order to reduce impacts to agriculture, the transmission line would be routed along the edges of irrigated fields, or would span fields to the extent feasible. Possible impacts to croplands also were minimized by increased opportunities to use public roads, section lines, and existing trails. BEPC's decision to use single-pole structures (rather than H-frame structures) would result in reduced long-term impacts by eliminating areas between H-frame structure legs that cannot be cultivated and by allowing lines to be constructed adjacent to property and section lines.
- **Pasture/Rangeland:** Long-term impacts may occur to grassland and rangeland communities. Recovery of these habitats may take a minimum of five to seven years due to poor soil and low moisture conditions. Planted grasslands would typically regenerate quickly after cleanup and reseeded of the construction ROW, typically within two years. Due to low moisture content, recovery of pasture/rangeland vegetation could take several years. Project construction would affect 84 to 98 acres of pasture/rangeland.
- **Shrubland and Barren Lands:** A minimal amount of shrubland and barren land would be temporarily affected by Project construction. Construction of Route Options A or B would affect approximately four acres; construction of Route Option C would affect approximately eight acres. The community is sparsely vegetated and soil disturbance is likely to result in increased soil erosion from wind and water. Due to low moisture content, recovery of shrubland vegetation could take several years. Soil erosion impacts could be reduced by prompt revegetation of disturbed areas.
- **Woodlands:** Woodlands were avoided during detailed routing, to the extent practicable. Clearing of woodland vegetation within the construction ROW would result in long-term and permanent environmental change. In this region, it is anticipated that re-growth of woodlands to mature conditions could take between 50 to 100 years, depending on the species (long-term impact); however, BEPC would carry out ROW maintenance to remove tall woody species. Trees removed during construction would be replaced by BEPC at a 2:1 ratio and planted at locations amenable to landowners.
- **Wetland/Riverine:** Impacts to wetlands are not anticipated. Wetlands (including palustrine and riparian areas) would be avoided or spanned. Project mitigation measures (**appendix D**) have been developed to ensure that impacts to wetlands would be avoided or minimized. These measures include:
 - A buffer zone around wetlands when feasible to prevent impacts to those ecosystems;
 - Spanning of wetland and riverine communities;
 - Re-seeding disturbed areas using native vegetation; application of BMPs to minimize potential soil compaction, erosion, and sedimentation, and use of sediment control and erosion control devices.
 - Developing a SPCC Plan prior to the start of construction to prevent the potential for spills of hazardous substances to streams. The plan would include a procedure for storage of hazardous materials and refueling of construction equipment outside of riparian zones, spill containment and recovery plan, and notification and activation protocols;
 - Refueling and staging areas located away from waterbodies to prevent contamination;
 - Herbicides used to control noxious weeds would be applied in accordance with label instructions by a certified applicator; and
 - Establishing erosion and sediment controls prior to construction that are maintained throughout restoration.

- Developed Lands: Construction or operation of Route Options A or B would not affect developed lands. Construction of Route Option C would temporarily affect 1.8 acres of developed lands. Lands that would be affected are adjacent to the Ray wastewater treatment facility.

Construction would avoid periods of extreme soil saturation, thus rutting would be minimized to the extent practicable and soil compaction within cultivated lands would be mitigated through normal cultivation. There are no sensitive plant species within areas that would be affected by Project construction and Federally listed or State-listed threatened or endangered species would not be affected.

4.4.2.1 Sensitive Ecological Communities

Impacts to sensitive ecological communities identified as possible within the Proposed Project Route Options could include loss of individuals or local populations as a result of crushing from construction vehicles and equipment, and clearing and construction of transmission line components. Invasion of suitable habitat by noxious weeds also could result from construction activities. Although several sensitive ecological communities were identified by the NDNHI as present in the vicinity of the Preferred Route and Route Options, none are within the preferred transmission line ROW and the communities would not be affected by BEPC's Proposed Project.

4.4.2.2 Noxious Weeds

Noxious weeds, if not controlled, can displace native plant species, rendering infested areas unproductive. They could be introduced to the Project area as a result of bringing in weed-contaminated equipment from off site, using straw (for surface water control) that is not weed free, and using seed mixtures that are not weed free.

Project-specific mitigation measures (**appendix D**) to reduce the introduction of noxious weeds would include BEPC implementing a weed management plan prior to construction. The plan would include construction and restoration procedures that detail:

- Coordinating with the appropriate Federal, State, and local agencies to: 1) obtain written recommendations from local soil conservation authorities or land management agencies regarding permanent erosion control and revegetation specifications and 2) develop specific procedures in coordination with the appropriate agency to prevent the introduction or spread of noxious weeds resulting from construction and restoration activities;
- Application of approved herbicides by trained personnel and according to label directions;
- Ensure that soil that is imported for agricultural or residential use has been certified as weed-free, unless otherwise approved by the landowner;
- Ensure that the contractor will use only weed-free straw or hay for sediment control devices or mulch applications;
- Cleaning all equipment and vehicles prior to the beginning of construction; and
- Monitoring restoration for three years following construction.

There are no sensitive ecological communities within the Preferred Project route and such resources would not be affected by the proposed Project. Although several species of noxious or invasive weeds are potentially present within the Project area, the spread of such species would be controlled through best management practices, including washing of vehicles that would be used for construction and the use of weed-free materials. Long-range monitoring and control of noxious weeds also would prove to be beneficial in areas where such monitoring and controls are not in effect.

4.5 Wildlife and Fisheries

4.5.1 Affected Environment

Wildlife use within the proposed Project area was characterized from a literature review including NDGFD's Comprehensive Wildlife Conservation Strategy (Hagen et al. 2005), as well as both 2008 spring and fall field investigations. Additionally, agency correspondence and species information was collected from the USFWS, NDGFD, and the NDNHI (USFWS 2008b; NDGFD 2008; NDNHI 2008). The literature review included a broad corridor along the three Route Options as well as field investigations along the Preferred Route (Route Option C) that included pulling and tensioning sites that were outside of the designated ROW.

Terrestrial Wildlife

The predominant wildlife habitats along the proposed Project consist of cropland and pasture/rangeland, which provide habitat to support a diversity of wildlife species.

Big Game

Big game species within the Proposed Project area include white-tailed deer (*Odocoileus virginianus*), with possible occurrence of mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana*). No seasonal big game ranges were identified by the NDGFD (NDGFD 2008).

Small Game

Small game species that occur within the Proposed Project area include native and non-native furbearers, upland game birds, and waterfowl. Common furbearers within the Project area include red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), and coyote (*Canis latrans*).

Common upland game birds in the Proposed Project area include ring-necked pheasant (*Phasianus colchicus*, an introduced species), sharp-tailed grouse (*Tympanuchus phasianellus*), gray partridge (*Perdix perdix*, an introduced species), and wild turkey (*Meleagris gallopavo*). Representative waterfowl species include mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), northern shoveler (*Anas clypeata*), and gadwall (*Anas strepera*).

Nongame Species

A diverse number of nongame species (e.g., small mammals, raptors, passerines, amphibians, and reptiles) occupy a variety of trophic levels and habitat types along the Preferred Route. Common wildlife species include small mammals such as bats, voles, squirrels, gophers, and mice. These small mammals provide a substantial prey base for predators in the area including larger mammals (coyote and badger), raptors (eagles, hawks, accipiters, owls), and reptiles.

Migratory birds are protected by the MBTA (16 USC 703-711) and EO 13186 (66 FR 3853), which makes it unlawful to take, kill, or possess migratory birds. EO 13186 was enacted to, among other things, ensure that environmental analyses of Federal actions evaluate impacts of actions and agency plans on migratory birds. Federally listed and other sensitive bird species are discussed in section 4.6.

Migratory birds are considered integral to natural communities and act as environmental indicators based on their sensitivity to environmental changes caused by human activities. Examples of migratory bird species that occur along the Preferred Route include the mourning dove (*Zenaidura macroura*), killdeer (*Charadrius vociferus*), common nighthawk (*Chordeiles minor*), western kingbird (*Tyrannus verticalis*), eastern kingbird (*Tyrannus tyrannus*), horned lark (*Eremophila alpestris*), eastern bluebird (*Sialia sialis*), mountain bluebird (*Sialia currucoides*), common yellowthroat (*Geothlypis trichas*), clay-colored sparrow (*Spizella pallida*), vesper sparrow (*Pooecetes gramineus*), lark sparrow (*Chondestes grammacus*), savannah sparrow (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), Baird's sparrow (*Ammodramus bairdii*), black-billed cuckoo (*Coccyzus erythrophthalmus*), bobolink (*Dolichonyx oryzivorus*), chestnut-collared longspur (*Calcarius ornatus*), dickcissel (*Spiza americana*), grasshopper sparrow (*Ammodramus savannarum*), lark bunting

(*Calamospiza melanocorys*), LeConte's sparrow (*Ammodramus leconteii*), loggerhead shrike (*Lanius ludovicianus*), marbled godwit (*Limosa fedoa*), Sprague's pipit (*Anthus spragueii*), and upland sandpiper (*Bartramia longicauda*) are migratory bird species that may occur within the proposed Project area.

Raptor species that occupy habitats within northwestern North Dakota are those associated with tall- and mixed-grass prairie, shrubland, woodlands, wetlands, and cropland. Those species include bald eagles (*Haliaeetus leucocephalus*), golden eagles (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), American kestrel (*Falco sparverius*), prairie falcon (*Falco mexicanus*), burrowing owl (*Athene cunicularia*), great horned owl (*Bubo virginianus*), short-eared owl (*Asio flammeus*), northern harrier (*Circus cyaneus*), and other birds of prey including the turkey vulture (*Cathartes aura*) (Peterson 1990). Protected raptor species that have been identified for the proposed Project area include bald eagle, ferruginous hawk, northern harrier, Swainson's hawk (*Buteo swainsoni*), short-eared owl, and burrowing owl (**Appendix E**, Special Status Species). These species all are designated as North Dakota Species of Conservation Priority. Woodlands within the area are limited, but would provide nesting and perching opportunities for many raptor species; prairie and rangeland would provide nesting opportunities for the burrowing owl and foraging opportunities for other raptor species.

Fisheries Resources

The Project area includes several occasional intermittent and ephemeral streams. One perennial stream, the Little Muddy River, is crossed in Williams County. Federal and State wildlife agencies have not expressed concerns for fish species or sensitive aquatic habitat within any of the waterbodies within the proposed Project area. In addition, no waterbodies within the proposed Project area contain species managed by the National Marine Fisheries Service, or support essential fish habitat (EFH) as defined under the Magnuson-Stevens Fishery Conservation and Management Act. Therefore, the proposed Project would not affect EFH.

4.5.2 Environmental Consequences

Impact analysis focused on wildlife species and associated habitats that may be affected by construction and/or operation of the proposed Project. Methods for establishing a baseline of status, occurrence and associated habitat of wildlife that may occur within the proposed Project area include reviewing published literature, natural heritage database information, internet websites, agency correspondence, and field surveys. Biologists with the USFWS, NDGFD, and NDNHI were contacted for information about the status of wildlife species, habitat, special wildlife features and habitats in the proposed Project area (USFWS 2008b; NDGFD 2008; NDNHI 2008). Initial baseline biological surveys were conducted in April 2008; with more extensive field surveys conducted in September 2008 and June 2009.

Project areas that would be temporarily impacted include a 12-foot-wide access trail between structure locations, structure pads (work sites), pulling and tensioning sites, and splicing sites as described in section 3.2.4 and presented in **table 3-2**. As noted in **table 3-2**, temporary impacts associated with construction of Route Options A, B, and C would total 254, 243, and 273 acres, respectively. Three 15-acre laydown areas also would be temporarily impacted. Acres of suitable habitat that could be affected have been estimated based on vegetation community acreages, presented in **table 4-8**. The fact that the disturbed area would be linear and narrow in most areas helps reduce the potential level of impact on wildlife species.

Significance Criteria

Wildlife Resources

- Declining populations or local extinctions of wildlife populations, migratory species and resident avian species from loss of associated habitat would represent a significant impact. Significant impacts also would result from permanent habitat fragmentation causing displacement of wildlife, vehicle and equipment operation causing loss of eggs, nests, or young beyond one season.
- Significant impacts also would result from violation of MBTA, or substantial losses of bird species (i.e., raptors and waterfowl) from electrocution or collision with transmission lines.

4.5.2.1 Preferred Transmission Line Route and Route Options

Game Species

Impacts to big game and small game species would include an incremental short-term reduction of forage habitat. However, these incremental losses of vegetation would represent only a small percentage of the overall available habitat within the broader Project region. The loss of native vegetation would be long-term (greater than 5 years and, in some habitats, more than 20 years). In the interim, herbaceous species may become established within 3 to 5 years, depending on future weather conditions and grazing management practices that would affect reclamation success in the Project area. In most instances, suitable habitat adjacent to the disturbed areas would be available for wildlife species until vegetation reestablished within the disturbance areas. In addition, BEPC would replant disturbed areas with native species or non-native species as directed by the appropriate agency/landowner (see **appendix D**) and the ROW would be monitored to control establishment of woody vegetation.

Indirect impacts would result from increased human activity and noise levels during transmission line construction. Big game species as well as small game species would likely decrease their use within and adjacent to surface disturbing activities due to increased noise levels. This displacement of both big game and small game species would be temporary and short-term and animals would return to the disturbance area following construction activities.

Nongame Species

Direct impacts to nongame species (e.g., mammals, birds, reptiles, nests) from surface disturbance activities would result in incremental short-term loss of habitat. The impacts would continue until construction activities stopped and vegetation became reestablished. Impacts include mortalities of less mobile or burrowing nongame species (e.g., small mammals, birds, reptiles, amphibians, invertebrates) caused by operating vehicles and equipment. Although some species would be temporarily displaced during construction, habitat fragmentation effects would be short-term.

Indirect impacts would include short-term displacement of highly mobile species (e.g., larger mammals, adult birds) caused by increased noise levels and human activities during construction. Displacement of nongame species from disturbance areas would be temporary and animals would be expected to return to the disturbance areas following construction activities. Effects of habitat fragmentation would be short-term and temporary.

The MBTA makes it unlawful to take, kill, or possess migratory birds. Habitat alteration, human disturbance, and power line collisions or electrocutions could result in direct impacts to migratory species including loss of individuals, abandonment of nests or young, and the loss of nests, eggs, or young. However, these impacts would be reduced by following mitigation measures from Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (Avian Power Line Interaction Committee [APLIC] 2006) and Mitigating Bird Collisions with Power Lines: The State of the Art in 1994 (APLIC 1994). Prior to construction, BEPC would contact the USFWS for guidance regarding mitigation measures that may be necessary to protect migratory birds.

BEPC does currently plan some transmission line construction activities during the nesting period (typically March through July) for migratory birds. As part of the Project-specific mitigation measures (**appendix D**), BEPC would conduct pre-construction surveys to locate active bird nests for species protected under the MBTA and establish buffers (if necessary) until the nesting season is complete. BEPC would contact the USFWS and Western before surveys are conducted to acquire approval for survey methods and monitoring requirements.

Electrocution and collision with power lines is a major cause of mortality for raptors, waterfowl, and whooping cranes. Additionally, collision potential depends on transmission line design, the location of the transmission line relative to high-use habitat areas (e.g., nesting, foraging, and roosting), and bird flight patterns and movement corridors. Following the mitigation measures from Suggested Practices (APLIC 2006) and Mitigating Bird Collisions, mentioned above, (APLIC 1994), collision impacts for raptors and other foraging bird

species would be minimized. Conductor-to-ground and conductor-to-conductor distances that are proposed for the transmission line are approximately 10 feet and 20 feet, respectively (refer to **figure 2-1**), which is sufficient to preclude electrocution of avian species. Contact electrocution is primarily a distribution line issue.

Construction-related impacts on fisheries would be limited to land disturbing activities that would directly affect receiving streams and could include the movement of heavy equipment, riparian, and the use of herbicides. Since such activities would be avoided, related impacts to fisheries resources are not anticipated. Mitigation measures have been developed (see **appendix D**) to reduce impacts to waterbodies crossed by the proposed Project. Those measures include:

- Avoiding or spanning all streams and drainages;
- Developing a SPCC Plan prior to the start of construction to prevent the potential for spills of hazardous substances to streams. The plan would include a procedure for storage of hazardous materials and refueling of construction equipment outside of riparian zones, spill containment and recovery plan, and notification and activation protocols;
- Refueling and staging areas located away from waterbodies to prevent contamination;
- Herbicides used to control noxious weeds would be applied in accordance with label instructions by a certified applicator; and
- Establishing erosion and sediment controls prior to construction that are maintained throughout restoration.

4.6 Special Status Species

Special status species are those in which State and/or Federal agencies provide protection by law, regulation or policy. Federally listed and federally proposed for listing species and designated critical habitat are protected under the ESA. For this analysis, special status species also include those species that have been designated as species of conservation priority by NDGFD that could be affected by Project construction and/or operation.

The State of North Dakota categorizes wildlife species into three levels of conservation priority (Hagen et al. 2005). The following categories were developed to describe the conservation needs for North Dakota species of conservation priority:

- Level I: species with a high level of priority due to the declining status here or across the range or high rate of occurrence in North Dakota, constituting the core of the species breeding range but are at-risk range wide.
- Level II: species with a moderate level of priority or species with a high level of priority but a substantial level of non-State wildlife grants funding.
- Level III: species with a moderate level of priority but are believed to be peripheral or non-breeding in North Dakota.

Special status species analysis focused on wildlife and plant species and habitats that may be affected by BEPC's construction and operation of the Proposed Project. The analysis considered Federal laws and State statutes. The ESA is administered by the USFWS and provides broad national protection for fish, wildlife, and plants that are listed as endangered or threatened. The ESA outlines procedures for Federal agencies to follow when a listed species or designated habitat may be affected by an action they authorize, fund, or permit. The State of North Dakota does not have an endangered species law. The MBTA also is administered by the USFWS. The MBTA is a Federal law enabling the U.S. to fulfill its international, bilateral conventions for conserving migratory bird populations and their habitats. Additionally, the Bald and Golden Eagle Protection Act (BGEPA), also administered by the USFWS, provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such

birds. Revised regulations providing mechanism to authorize take under BGEPA went into effect June 19, 2008.

Methods for establishing a baseline of status, occurrence, and associated habitat of wildlife that may occur within the proposed Project area include reviewing published literature, natural heritage database information, internet websites, agency correspondence, and field surveys. Biologists with the USFWS, NDGFD, and NDNHI were contacted for information about the status of wildlife species, habitat, special wildlife features, and habitats in the proposed Project area (USFWS 2008b; NDGFD 2008; NDNHI 2008). Baseline biological surveys of the Project area were conducted in September 2008.

4.6.1 Affected Environment

The analysis for special-status species focused on those species that could occur within the Project area. Special status species originally considered for the Proposed Project area presented in **Appendix E**, Special Status Species. The evaluation determined that some of these species would not occur in the Project area or would otherwise not be affected by the Proposed Project. Comments are provided on these species in **appendix E**.

4.6.1.1 Special Status Wildlife Species

A total of 64 special status wildlife species were identified by the USFWS, the State of North Dakota, and the NDNHI as occurring within the Project vicinity (USFWS 2008b; Hagen et al. 2005; NDNHI 2008). These species, their habitat associations, and their occurrence within the study area are summarized in **Appendix E**, Special Status Species. Occurrence for each species was based on habitat requirements and known distribution. Based on these evaluations, 24 species have been eliminated from detailed analysis, of which, two of these species are federally listed species (threatened and endangered) and two species are candidates for listing as threatened or endangered. The federally listed species that have been eliminated from consideration are the gray wolf (*Canis lupus*), interior least tern (*Sterna antillarum*), pallid sturgeon (*Scaphirynchus albus*), and Dakota skipper (*Hesperia dacotae*). The gray wolf was eliminated because it is highly unlikely to be within the project area and would only be present as a migratory occurrence. Interior least tern was eliminated because nesting habitat is not present. Pallid sturgeon was eliminated because the species requires large fast-flowing rivers, which are not present within the Project area. The Dakota skipper is a Federal candidate species that is not found in western Mountrail County or Williams County.

Non-listed species eliminated from detailed analysis include arctic shrew (*Sorex arcticus*), greater prairie chicken (*Tympanuchus cupido*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), peregrine falcon (*Falco peregrinus*), pygmy shrew (*Sorex hoyi*), horned grebe (podiceps auritus), red-headed woodpecker (*Melanerpes erythrocephalus*), Richardson's ground squirrel (*Spermophilus richardsonii*), sagebrush vole (*Lemmiscus curtatus*), swift fox (*Vulpes velox*), western small-footed myotis (*Myotis ciliolabrum*), and eight species of fish. Of the remaining 40 species retained for analysis, two are listed species; whooping crane (*Grus americana*) and piping plover (*Charadrius melodus*). Special status wildlife species that have been retained for analysis are discussed below and in **appendix E**. No designated critical habitat for any species is located within BEPC's Proposed Project.

Federally Listed Wildlife Species

Whooping Crane

The whooping crane is a federally endangered species and a North Dakota Level III species of conservation priority. Collision with power lines is the greatest source of non-natural mortality for fledged whooping cranes that migrate between nesting and wintering habitat (USFWS 2006). Designated critical habitat, nesting habitat, and breeding rookeries are not present in the vicinity of the Proposed Project. However, the proposed Project area is located within the yearly migratory route for the Aransas – Wood Buffalo population. Species records show migration routes through Williams and Mountrail counties (USFWS 2006). Whooping cranes may migrate through the Project area in the spring (April to mid-May) and in the fall (mid-September to October). Suitable stop-over habitat for migrating whooping cranes includes wetlands and ponds for roosting and/or feeding. Individual cranes typically spend only a few days at a given site during migration before moving on.

Piping Plover

The piping plover is a federally threatened species and a North Dakota Level II species of conservation priority. The piping plover is generally characterized as using exposed, sparsely vegetated shores, and islands of shallow, alkali lakes and impoundments for breeding (Hagen et al. 2005). Salt-encrusted, alkali, or subsaline semipermanent lakes, ponds, and rivers with wide shorelines of gravel, sand, or pebbles are preferred (Hagen et al. 2005). Piping plovers forage on fly larvae, beetles, crustaceans, mollusks, and other small animals near the shoreline or sometimes by the nest. It is expected that the piping plover would only use the Proposed Project area for migration and forage purposes; breeding and nesting would most likely be associated with riverine areas associated with Lake Sakakawea and the Missouri River.

North Dakota Wildlife Species of Conservation Priority

Grassland Associated Species

Baird's sparrow (*Ammodramus bairdii*), black-billed cuckoo (*Coccyzus erythrophthalmus*), bobolink (*Dolichonyx oryzivorus*), chestnut-collared longspur (*Calcarius ornatus*), dickcissel (*Spiza americana*) grasshopper sparrow (*Ammodramus leconteii*), lark bunting (*Calamospiza melanocorys*), LeConte's sparrow (*Ammodramus leconteii*), loggerhead shrike (*Lanius ludovicianus*), marbled godwit (*Limosa fedoa*), Sprague's pipit (*Anthus spragueii*), and upland sandpiper (*Bartramia longicauda*), are migratory bird species that may occur within the Proposed Project area. These migratory bird species are associated with grassland habitats.

Perching Species

Red-tailed hawk (*Buteo jamaicensis*), Ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), short-eared owl (*Asio flammeus*), and Swainson's hawk (*Buteo swainsoni*) also are migratory birds and raptor species that may occur within the proposed Project area and are associated with grassland habitats. Several raptor species were observed foraging in close proximity to the Preferred Route during September 2008 field surveys of the Project area including Swainson's hawk, northern harrier, and red-tailed hawk.

Lekking Species

Sharp-tailed grouse are found in mixed-grasslands with patches of small trees or shrubs. During the breeding season male sharp-tailed grouse congregate on specific areas known as leks in the early morning to impress nearby females. Leks are usually located within wet meadows, ridges, and knolls, or recently burned areas. No lek sites for sharp-tailed grouse have been identified by the NDGFD or the NDNHI in the vicinity of the Proposed Project area. However, during the September 2008 survey of the Project area, numerous sharp-tailed grouse were observed.

Less Mobile and Burrowing Species

Plains spadefoot (*Spea bombifrons*), smooth green snake (*Liochlorophis vernalis*), short horned lizard (*Phrynosoma douglassi*) and western hognose snake (*Heterodon nasicus*) inhabit dry, open grasslands with sandy or loose soils and, occasionally rock crevices. Other habitat factors include proximity to water and small mammal burrows (Hagen et al. 2005). These species all utilize burrows during portions of their life history. Smooth green snake also may utilize hibernacula and have been documented hibernating within ant mounds. These species were not observed during September 2008 surveys.

Burrowing owl (*Athene cunicularia*), is a ground nesting owl which nests in abandoned mammal burrows, which they enlarge and excavate (Hagen et al. 2005). One burrowing owl was observed along the Preferred Route (see **appendix F, exhibit F-1**).

Wetland, and Riparian Associated Species

American avocet (*Recurvirostra americana*), American bittern (*Botaurus lentiginosus*), black tern (*Chlidonias niger*), canvasback (*Aythya valisineria*), Franklin's gull (*Larus pipixcan*), Nelson's sharp-tailed sparrow (*Ammodramus nelsoni*), northern pintail (*Anas acuta*), redhead (*Aythya americana*), sedge wren (*Cistothorus platensis*), willet (*Catoptrophorus semipalmatus*), Wilson's phalarope (*Phalaropus tricolor*), and yellow rail (*Corumicops noveboracensis*) are migratory bird species that may occur within the Proposed Project area and

are associated with wetlands, wetland complexes, and waterbody habitats. The Canadian toad (*Bufo hemiophrys*) and common snapping turtle (*Chelydra serpentina*) are associated with permanent lakes, ponds, rivers, and wetlands (Hagen et al. 2005). Although routing data indicate 2.8 to 9.4 acres of wetland habitat could be temporarily impacted by Project construction, all wetlands would be avoided or spanned during construction.

The September 2008 and June 2009 field surveys found habitat that would support these species including one perennial stream, the Little Muddy River, and a limited number of ponds or wetlands with permanent water. Additionally, occasional intermittent and ephemeral streams also were noted.

4.6.1.2 Special Status Fish Species

A total of nine special status fish species were identified by the USFWS, the State of North Dakota, and the NDNHI as occurring within the Project vicinity (USFWS 2008b; Hagen et al. 2005; NDNHI 2008). These species, their habitat associations, and their occurrence within the study area are summarized in **Appendix E**, Special Status Species. Based on evaluations, in **appendix E**, all nine fish species have been eliminated from detailed analysis.

The September 2008 and June 2009 field surveys did not identify habitat that would support these species. Only one perennial stream, the Little Muddy River, will be spanned by the proposed Project. These species are not known to occur in the Little Muddy River.

4.6.1.3 Special Status Plant Species

A total of three special status plant species were identified by the USFWS, the State of North Dakota, and the NDNHI as occurring within the Project vicinity (USFWS 2008b; Hagen et al. 2005; NDNHI 2008). These species, their habitat associations, and their occurrence within the Proposed Project area are summarized in **Appendix E**, Special Status Species. Based on evaluations found in **appendix E**, all three plant species have been eliminated from detailed analysis, none of which are federally listed species. The non-listed species eliminated from detailed analysis include Dakota buckwheat (*Eriogonum visherii*), heart-leaved buttercup (*Ranunculus cardiophyllus*), and jointed-spike sedge (*Carex athrostachya*). Species specific surveys for these plant species were not required by the NDGFD (NDGFD 2007b).

All three species may occur within the Project area, but were eliminated from detailed analysis as the habitat characteristics necessary to support these species were not found during September 2008 survey efforts.

4.6.2 Environmental Consequences

Impact analysis focused on special status species that may be affected by construction and/or operation of BEPC's Proposed Project. Methods for establishing a baseline of status, occurrence and associated habitat of wildlife that may occur within the Proposed Project area include reviewing published literature, natural heritage database information, internet websites, agency correspondence, and field surveys. Biologists with the USFWS, NDGFD, and NDNHI were contacted for information about the status of wildlife species, habitat, special wildlife features, and habitats in the Proposed Project area (USFWS 2008b; NDGFD 2008; NDNHI 2008). Initial baseline biological surveys were conducted in April 2008; with more extensive field surveys conducted in September 2008 and June 2009.

The USFWS recommends the following mitigation measures (USFWS 2008a) in order to minimize disturbances to fish and wildlife resources possibly occurring within the Project area:

- Time construction to avoid activities from April 1 through July 15 to minimize disruption to waterfowl or other wildlife during the nesting season, and to avoid high water conditions;
- Make no stream channel alterations or changes in drainage patterns;
- Replace trees/shrubs at a ratio of two planted for each one removed;

- Install and maintain appropriate erosion control measures to reduce sediment transport off-site; and
- Reseed disturbed areas with a mixture of native grass and forb species.

BPEC would implement the USFWS recommendations. For the first recommendation, if BEPC schedules construction during the nesting season, pre-construction surveys would be conducted to locate any active nests. Active nests would be avoided, and the USFWS consulted concerning buffer areas.

Further consultation with the NDGFD indicated that the State is concerned about construction disturbance to native prairie or wetland/riparian habitats. The NDGFD recommends avoiding work in these areas, not placing aboveground appurtenances in wetlands areas, and reclaiming disturbed areas to pre-Project conditions (NDGFD 2008).

Project area acres that would be temporarily impacted include a 12-foot-wide access trail between structure locations, structure pads (work sites), pulling and tensioning sites, and splicing sites as described in section 3.2.4 and presented in **table 3-2**. As noted in **table 3-2**, temporary impacts associated with construction of Routes Options A, B, and C would total 254, 243, and 271 acres, respectively. Acres of suitable habitat that could be affected have been estimated based on vegetation community acreages, presented in **table 4-8**.

Significance Criteria

- Significant impacts would result from jeopardizing the continued existence of a federally listed species, loss of individuals of a population of species that would result in a change in species status, violation of the MBTA, the ESA, or section 404 of the CWA (33 USC 1251, et seq., EO 11990).
- Electrocution or collision of bird species (i.e., whooping crane and raptors) with transmission lines that would jeopardize the population as a whole or result in a measurable reduction in species numbers would result in a significant impact.

4.6.2.1 Special Status Wildlife Species

Special status species include those listed by the USFWS as threatened, endangered, and candidates or proposed for listing as either threatened or endangered, as well as those designated by the State as a species of conservation priority.

Possible impacts to special status wildlife species would be similar to those discussed for general wildlife. Direct impacts include mortalities caused by construction activities (e.g., crushing from vehicles and equipment) and permanent structures (e.g., collision with power lines); habitat loss, manipulation or fragmentation; and animal displacement. Indirect impacts to wildlife may include increased noise occurrence, increased human activity, increased presence of noxious and invasive weeds, and increased dust from unpaved roads. Indirect impacts also would include short-term displacement of mobile species (e.g., larger mammals, adult birds) caused by increased noise levels and human activities during construction. Impact levels would depend upon timing and type of construction, sensitivity of the impacted species, and seasonal use patterns.

In order to minimize impacts to special status wildlife species, BEPC would coordinate with the USFWS and the NDGFD and comply with the terms and conditions of any mitigation plan for special status species that would be developed and approved by those agencies prior to construction. Consultations with these agencies would be conducted to determine appropriate and feasible buffers for the Proposed Project. Monitoring would be conducted in accordance with any mitigation plan that may be necessary as a result of impact analyses.

Federally Listed Species

Whooping Crane

The Proposed Project would not affect whooping crane nesting habitat or breeding rookeries. BEPC's construction and operation of the Proposed Project would occur within the whooping crane migratory route, and may result in an increase in collision risk. Collision with power lines, although primarily of distribution voltage, is the largest source of non-natural mortality for migrating whooping cranes. Collision potential depends on the location of the transmission line relative to high-use habitat areas (e.g., nesting, foraging, and roosting), bird flight patterns, and movement corridors. Specifically for whooping cranes, collision potential increases when power lines are constructed between suitable wetland roosting and foraging habitat while at a stop-over site. Cranes tend to fly at low altitudes between these two sites, increasing the chances for collision.

The September 2008 and June 2009 field surveys identified several locations crossed by the Project or adjacent to the Project area that could be considered suitable stop-over habitat. The Proposed Project area occurs within the western portion of the whooping crane migration corridor. Based on the number of whooping crane sightings that have been recorded by the USFWS through 2009, the potential occurrence of whooping crane is high. Recent whooping crane sightings are identified on **figure 4-1**.

BEPC's has committed to implementing the suggested minimization measures from Suggested Practices (APLIC 2006) and Mitigating Bird Collisions (APLIC 1994) outlined in **appendix D** to limit collisions. BEPC is coordinating with the USFWS regarding additional minimization measures.

Piping Plover

Direct impacts to piping plover from BEPC's construction of the Proposed Project may include disturbance of piping plover stop-over habitat. The Proposed Project could cause displacement, injury, or direct mortality of individuals. These impacts are highly unlikely as the transmission line would span and structures would be placed outside the limited habitat for this species. Construction activities and associated noise occurring in the vicinity of stop-over habitat could temporarily disrupt and displace individuals if they are present. The September 2008 and June 2009 field surveys identified one location crossed by the Project or adjacent to the Project area that could be considered suitable stop-over habitat. This location, which is a small ponded area (approximately one acre) with marginal alkali habitat could provide migration or foraging habitat for the piping plover. However, it does not contain suitable characteristics to provide nesting or breeding habitat for the species. Therefore, BEPC's Proposed Project is not expected to impact the species.

Informal consultation with the USFWS is ongoing regarding impacts and minimization measures to protect the whooping crane and piping plover. Concepts under consideration include line marking to reduce collisions with static wires. BEPC will comply with the provisions in the Project biological assessment; these provisions would ensure compliance with the ESA and would minimize impacts to the whooping crane and piping plover.

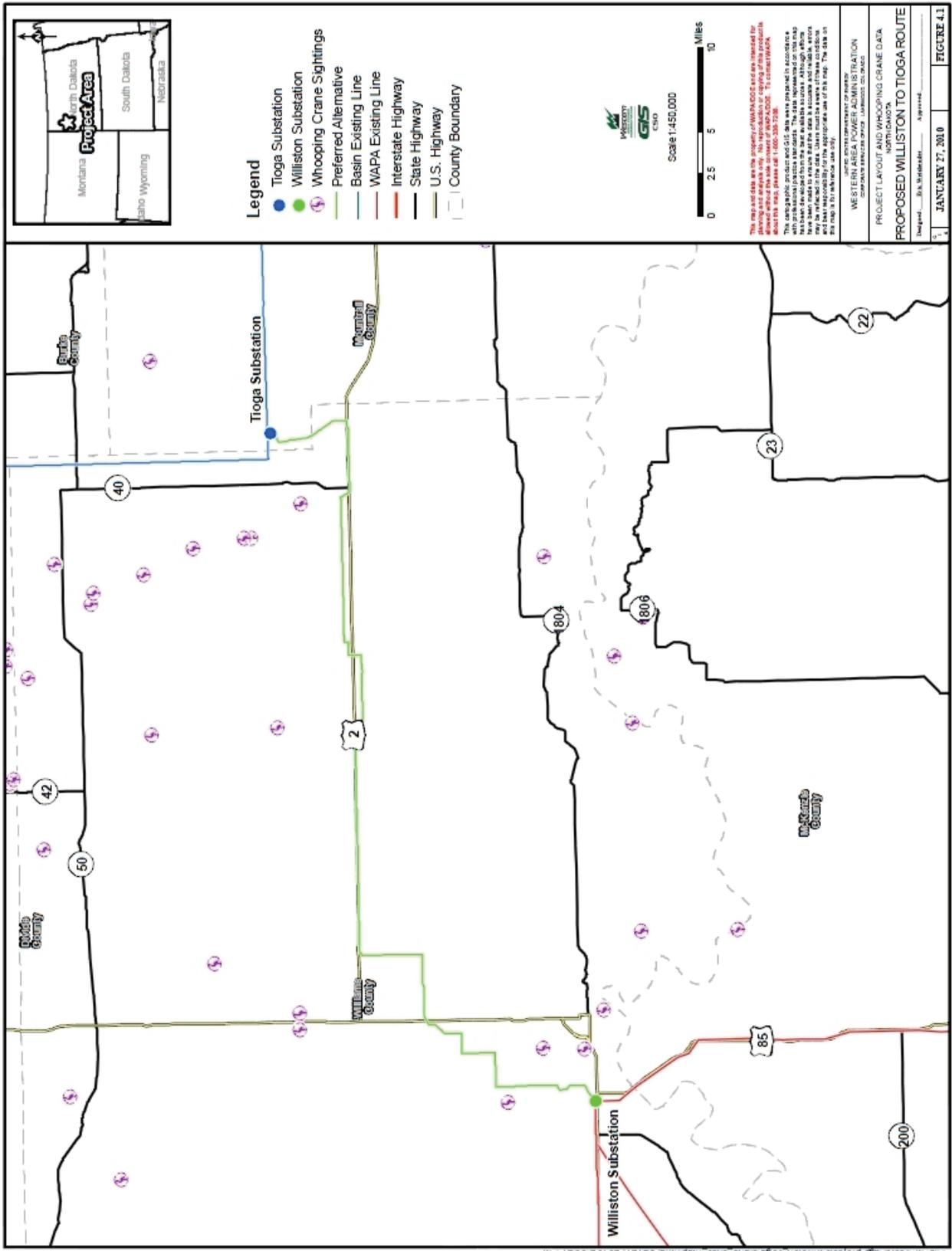


Figure 4-1 Whooping Crane Sightings

North Dakota Species of Conservation Priority

Grassland Associated Species

Temporary impacts to Baird's sparrow, burrowing owl, black-billed cuckoo, bobolink, chestnut-collared longspur, dickcissel, ferruginous hawk, grasshopper sparrow, lark bunting, Leconte's sparrow, loggerhead shrike, marbled godwit, northern harrier, plains spadefoot, sharp-tailed grouse, short-eared owl, short-horned lizard, smooth green snake, Sprague's pipit, Swainson's hawk, upland sandpiper, and western hognose snake would be limited to temporary disturbance during construction. Although temporary displacement could occur during construction, actual loss of individuals would be unlikely. Impacts to nesting species could be avoided by BEPC scheduling initial ground disturbing activities to avoid the nesting season to the extent practicable. Field surveys would be carried out during nesting periods to determine the presence of such species if construction activities are scheduled during the nesting period.

Indirect impacts may include the incremental reduction and degradation of habitat by the construction of the proposed transmission line and infrastructure. Construction of the Proposed Project would also provide additional hunting perches for raptors. With the exception of raptor species, this could cause indirect impacts through the facilitation of depredation. BEPC's Project-specific standard mitigation measures (**appendix D**) also indicate that BEPC plans conduct pre-construction surveys to locate active bird nests for species protected under the MBTA and establish buffers (if necessary) until the nesting season is complete.

Perching Species

In addition to the temporary and indirect impacts indicated above, additional temporary impacts to ferruginous hawk, northern harrier, short-eared owl, and Swainson's hawk may occur due to human activities. Impacts associated with collision with conductor or OPGW would be similar among Route Options and would be mitigated by line marking devices. Electrocution impacts associated with any of BEPC's three Route Options are not expected due to line and structure spacing. Distances between conductors and between conductors and structures exceed the wingspan of avian species that frequent the area. According to BEPC's mitigation measures (**appendix D**), if construction is to occur during the breeding season for raptors (February 1 through August 15), prior to construction activities, raptor breeding surveys would be conducted by a qualified biologist through areas of suitable nesting habitat to identify any active nest sites within 0.5 mile from the Project area. If applicable, appropriate protection measures, including seasonal constraints and establishment of buffer areas would be implemented at active nest sites until the young have fledged and have dispersed from the nest area. These measures would be implemented on a site-specific and species-specific basis, in coordination with USFWS.

Lekking Species

Direct impacts of construction to sharp-tailed grouse may include the loss of lekking grounds and other habitat. Depending on the timing of construction, the proposed Project could impact sharp-tailed grouse during lekking activities or brood rearing, and could cause displacement, injury, or direct mortality of individuals. These species are particularly sensitive to disturbances while they gather on lekking grounds each morning and evening from March to June. Construction activities and associated noise occurring in early morning and late evening in the vicinity of lekking grounds could disrupt and displace individuals that have gathered for breeding activities. Lekking grounds were not observed during field investigations; therefore it is not expected that the species would be impacted by the Proposed Project.

Less Mobile and Burrowing Species

Direct impacts to burrowing owl, plains spadefoot, short-horned lizard, smooth green snake, and western hognose snake could result from surface disturbing activities (e.g., crushing by vehicles and equipment) and result in mortalities of these less mobile or burrowing species. Additional direct impacts may include the destruction of burrows and hibernacula, which could result in the displacement of burrowing species into less suitable habitats, increasing susceptibility to predation, reducing cover or forage habitat, or reducing reproductive success. Preconstruction surveys would be performed to determine the presence or absence of burrowing owls within the construction area.

Wetland, and Riparian Associated Species

Impacts to the American avocet, American bittern, black tern, canvasback, Canadian toad, common snapping turtle, Franklin's gull, horned grebe, Nelson's sharp-tailed sparrow, northern pintail, redhead, sedge wren, willet, Wilson's phalarope, and yellow rail would be minimal because the Preferred Route (or Route Options) avoids open water, wetlands, and a 100-foot buffer would be maintained around riparian habitats. Collision impacts would be mitigated by installation of line marking devices per USFWS recommendations. Temporary impacts to the above-referenced species would be limited to temporary disturbance during construction. Although temporary displacement could occur during construction, actual loss of individuals would be unlikely. Impacts to nesting species could be avoided by the avoidance of these areas and BEPC's scheduling of initial ground disturbing activities to avoid the nesting season to the extent practicable. Field surveys would be carried out during nesting periods to determine the presence of such species if construction activities occur during the nesting season.

It is unlikely that the Canadian toad or common snapping turtle would be affected by Project construction as such activities would take place outside of a 100-foot buffer from the waterbody. A 100-foot buffer for wetlands, riparian areas, and aquatic habitats would be provided. Preconstruction survey and buffer protocol would be coordinated with USFWS.

4.6.2.2 Special Status Fish Species

Impacts to special status fish species would not occur as the Project area does not contain suitable habitat for these species, and they are not present.

4.6.2.3 Special Status Plants Species

Impacts to special status plant species would not occur as the Project area does not contain suitable habitat for these species, and they are not present.

4.7 Archaeological and Historic Resources

Archaeological and historic resources are protected by a series of Federal laws enacted to protect these resources from damage or loss due to Federal undertakings, or private undertakings operating under Federal license, Federal funding, or on federally managed lands. The public's recognition that these non-renewable resources are important and should be protected began in the 20th Century and continues to the present. Three of the most important laws are the NHPA of 1966, as amended; the American Indian Religious Freedom Act (AIRFA) of 1978; and the Archaeological Resource Protection Act of 1979. EO 11593 also provides necessary guidance on protection and enhancement of archaeological and historic resources. New legislation and emphases that have come to the forefront over the past 20 years include the Native American Graves Protection and Repatriation Act (NAGPRA); EO 13007, the consideration of historic and traditional landscapes; and the increased awareness of and consultation for traditional cultural properties.

4.7.1 Affected Environment

From February 27 to June 20, 2008, Metcalf Archaeological Consultants, Inc. (Metcalf) conducted a Class I records and files search through the State Historical Society of North Dakota to identify previously conducted cultural resources inventories and previously documented cultural resources within the study area. The study area measured six miles wide centered on Corridors A and B. Additionally, Metcalf reviewed historic General Land Office (GLO) records to determine if remains of trails, transportation routes, homesteads, or other historic resources may be present in the study area. The locations of all previously recorded cultural resource sites and previously conducted surveys that had accompanying maps were digitized. Once digitized, the sites and surveys were displayed on maps to show their locations relative to the corridor boundaries and proposed transmission line routes (i.e., Route Option A, Route Option B, and Route Option C). Ultimately, the focus of the analysis was narrowed down to those sites located within 75 and 500 feet of the centerlines of Route Options A, B, and C (Preferred Route) (**table 4-10**). The distances were used to identify sites that could be within (or very close to) the Preferred Route ROW and those that could be impacted by transmission line construction. The results of the analysis are presented below in text and associated table.

Route Option A. A total of 14 previously recorded sites were identified within 500 feet of the Route Option A centerline; eight of the sites also were identified within 75 feet of the centerline (**table 4-10**). The eight sites within 75 feet of the centerline include three prehistoric stone circles, three prehistoric stone circles/cairns, one prehistoric stone circle and alignment, and a historic farmstead. All of the prehistoric sites are unevaluated and would require testing or additional archival research to determine their eligibility for the National Register of Historic Places (NRHP). The historic farmstead is documented as not eligible for the NRHP. The remaining six sites within 500 feet of the centerline include two prehistoric stone circles, two prehistoric stone circles/cairns, one historic bridge, and one site with prehistoric rock features. All five of the prehistoric sites are unevaluated and would require testing or additional archival research to determine their eligibility for the NRHP. The historic bridge is documented as eligible for the NRHP.

Route Option B. As a result of the files search, a total of 10 previously recorded sites were located within 500 feet of the Route Option B centerline; seven of the sites also are located within 75 feet of the centerline (**table 4-10**). The seven sites within 75 feet of the centerline include a prehistoric stone circle and alignment, two prehistoric stone circles, three prehistoric stone circles/cairns, and a historic trail. All of the prehistoric sites are unevaluated and would require testing or additional archival research to determine their eligibility for the NRHP. The historic trail was located during the GLO search and is not a recorded site; therefore, the eligibility is unknown at this time. The remaining three sites previously recorded within 500 feet of the centerline include a prehistoric stone circle/cairn, prehistoric cairn with flake, and historic cultural material scatter and depression. Both of the prehistoric sites are unevaluated and would require testing or additional archival research to determine their eligibility for the NRHP. The historic cultural material scatter and depression is documented as not eligible for the NRHP.

Route Option C (Preferred Route). A total of 26 previously recorded sites were located within 500 feet of the Preferred Route centerline; nine of the 26 sites also are located within 75 feet of the centerline (**table 4-10**). The nine sites within 75 feet of the centerline include an architectural site with various features, three prehistoric sites (stone circle/cairn, lithic isolated find, and chipped stone site lead), four historic sites (granary/windmill, cultural material scatter and depression, railroad crossing, and farmstead), and a modern residence. All of the prehistoric sites are unevaluated and would require testing or additional archival research to determine their eligibility for the NRHP. Sites not eligible for the NRHP include the modern residence, historic granary/windmill, and historic cultural material scatter and depression. The historic farmstead is documented as eligible for the NRHP. NRHP-eligibility of the architectural site with various features and historic railroad is unknown at this time.

The remaining seventeen sites within 500 feet of the Preferred Route centerline include five prehistoric sites (stone circle, stone circle with flake, stone cairn, and two stone circles/cairns), 11 historic sites (shed, granary, building/foundation, structure, two cultural material scatters and depressions, and five farmsteads), and a modern residence. All of the prehistoric sites and one of the two historic cultural material scatters and depressions are unevaluated and would require testing or additional archival research to determine their eligibility for the NRHP. The remaining historic sites are documented as not eligible for the NRHP.

Table 4-10 Previously Recorded Archaeological and Historic Resources Identified Through the Class I (Files Search) Inventory

Site Number	Site Type	Description	NRHP Evaluation	Route Option					
				A		B		C (Preferred Route)	
				Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet
32WI55	Architectural	Various features	Unknown					X	X
32WI162	Prehistoric	Circles	Unevaluated					X	
32WI166	Prehistoric	Circle/Cairn	Unevaluated	X					
32WI167	Prehistoric	Circles	Unevaluated	X					
32WI168	Prehistoric	Circles	Unevaluated	X	X				
32WI169	Prehistoric	Circles	Unevaluated	X					
32WI171	Prehistoric	Circles	Unevaluated	X	X				
32WI178	Prehistoric	Circles/Cairns	Unevaluated					X	X
32WI195	Prehistoric	Circles/Cairns	Unevaluated	X	X	X	X		
32WI214	Prehistoric	Circles/Cairns	Unevaluated	X	X	X	X		
32WI222	Prehistoric	Circle	Unevaluated	X	X	X	X		
32WI223	Prehistoric	Circles/Alignment	Unevaluated	X	X	X	X		
32WI234	Historic	Farmstead	Not Eligible	X	X				
32WI242	Architectural	Building/Foundation/CMS	Not Eligible					X	
32WI255	Historic	CMS/Depression	Not Eligible					X	
32WI261	Prehistoric	Circles/Cairns	Unevaluated	X		X			
32WI266	Prehistoric	Circle/Cairn	Unevaluated	X	X	X	X		
32WI401	Prehistoric	Circles	Unevaluated			X	X		
32WI409	Prehistoric	Cairn	Unevaluated					X	
32WI412	Prehistoric	Circle/Cairn	Unevaluated					X	

Table 4-10 Previously Recorded Archaeological and Historic Resources Identified Through the Class I (Files Search) Inventory

Site Number	Site Type	Description	NRHP Evaluation	Route Option					
				A		B		C (Preferred Route)	
				Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet
32WI418	Architectural	Shed	Not Eligible					X	
32WI419	Architectural	Residence	Not Eligible					X	X
32WI427	Architectural	Residence	Not Eligible					X	
32WI438	Architectural	Granary/Windmill	Not Eligible					X	X
32WI440	Architectural	Granary	Not Eligible					X	
32WI454	Historic	CMS/Depression	Unevaluated					X	
32WI458	Architectural	Nylander Farmstead	Not Eligible					X	
32WI461	Architectural	Foss Farmstead	Not Eligible					X	
32WI473	Architectural	Burlington-Daniel Farmstead	Not Eligible Feature 8 (granary) individual nomination					X	
32WI475	Architectural	Town Hall/R&W Fertilizer	Not Eligible Feature 1 (town hall/school) individual nomination					X	
32WI476	Architectural	Leverenz-Skogen Farmstead	Not Eligible					X	
32WI477	Architectural	Stevens Farmstead	Eligible					X	X
32WI478	Architectural	Vang-Erickson Farmstead	Not Eligible					X	
32WI910	Architectural	Bridge	Eligible	X					

Table 4-10 Previously Recorded Archaeological and Historic Resources Identified Through the Class I (Files Search) Inventory

Site Number	Site Type	Description	NRHP Evaluation	Route Option					
				A		B		C (Preferred Route)	
				Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet
32WI943	Prehistoric	Circles/Flake	Unevaluated					X	
32WI960	Prehistoric	Circles/Cairns	Unevaluated					X	
32WI969	Historic	CMS/Depression	Not Eligible					X	X
32WIx354	Prehistoric IF	Chipped Stone	Unevaluated		X			X	X
32WIx359	Prehistoric SL	Rock Features	Unevaluated	X					
32WIx401	Prehistoric SL	Circle	Unevaluated		X			X	X
T155N/ R101W Section 18	Center of the East Half of the East Half	Historic trail found during the GLO search; crosses the line	Not Recorded			X	X		
Railroad Crossings	Historic	Railroads-all crossings will need to be recorded	Not Recorded					X	X

CMS = Cultural Material Scatter.

IF = Isolated Find.

SL = Site Lead.

Source: Metcalf 2008a.

Results of the Class III Pedestrian Inventory

Metcalf conducted a Class III pedestrian inventory of the Preferred Route on August 18 through 22, 2008, and September 16 through 23, 2008 (Metcalf 2008b). A follow-up pedestrian survey was conducted during the spring 2009 to investigate resources that could be impacted along various transmission line reroutes. The survey areas consisted of a 200-foot-wide corridor centered on the Preferred Route transmission line centerline. The 200-foot-wide corridor was sufficiently broad to include an area of potential effects. With the exception of approximately 0.5 mile where access was denied by the landowner and 0.5 mile where access was not possible due to an impassable road, the entire preferred Route was surveyed for archaeological and historic resources. Pulling and tensioning sites that would be outside of the Preferred Route ROW (primarily at transmission line turning points) also were investigated.

A total of 64 archaeological and historic resources were identified during the 2008 Class III inventory (**table 4-11**). Nine of these resources are prehistoric lithic isolates. The remaining 55 resources include six prehistoric cairn sites, 35 prehistoric stone circle or stone circle and cairn sites, two prehistoric lithic scatters, eight historic sites, two railroads, one architectural site, and one multi-component site containing historic depressions, historic cultural material, and prehistoric stone circles. All of the isolated finds are recommended by the field archaeologist as not eligible for listing on the NRHP. Additional investigation of these resources is not planned.

Table 4-11 Archaeological and Historic Resources Located During the 2008 Class III Inventory

Smithsonian Number	Temporary Field Number	Site Type	NRHP Evaluation	Recommendations/ Comments
	MAC-WTT-1	Cairn	Unevaluated	Avoidance
	MAC-WTT-2	Stone Circle and Cairns	Unevaluated	Avoidance
	MAC-WTT-3	Historic Occupation	Unevaluated	Avoidance
	MAC-WTT-4	Railroad	Unevaluated	Avoidance
	MAC-WTT-5	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-6	Historic Road Bed	Unevaluated	Avoidance
	MAC-WTT-7	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-8	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-9	Stone Circles	Unevaluated	Avoidance
32WI454		Historic Graves	Unevaluated	Avoidance
	MAC-WTT-10	Railroad	Unevaluated	Avoidance
	MAC-WTT-11	Dump and Small Bridge	Unevaluated	Avoidance
	MAC-WTT-12	Lithic Scatter	Unevaluated	Avoidance
	MAC-WTT-13	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-14	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-15	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-16	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-17	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-18	Historic Artifact Scatter	Unevaluated	Avoidance

Table 4-11 Archaeological and Historic Resources Located During the 2008 Class III Inventory

Smithsonian Number	Temporary Field Number	Site Type	NRHP Evaluation	Recommendations/ Comments
	MAC-WTT-19	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-20	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-21	Historic Cemetery	Unevaluated	Avoidance
	MAC-WTT-22	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-23	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-24	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-25	Cairns	Unevaluated	Avoidance
	MAC-WTT-26	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-27	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-28	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-29	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-30	Stone Circle and Cairns	Unevaluated	Avoidance
	MAC-WTT-31	Lithic Scatter	Unevaluated	Avoidance
	MAC-WTT-32	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-33	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-34	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-35	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-36	Historic School	Unevaluated	Avoidance
	MAC-WTT-37	Cairn	Unevaluated	Avoidance
	MAC-WTT-38	Cairn	Unevaluated	Avoidance
	MAC-WTT-39	Stone Circles	Unevaluated	Avoidance
32WI969	MAC-WTT-40	Historic Occupation	Unevaluated	Avoidance
	MAC-WTT-41	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-42	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-43	Multi-Component (Prehistoric Stone Circles and Historic Depression and Scatter)	Unevaluated	Avoidance
	MAC-WTT-44	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-45	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-46	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-47	Historic Mine	Unevaluated	Avoidance
	MAC-WTT-48	Stone Circles	Unevaluated	Avoidance

Table 4-11 Archaeological and Historic Resources Located During the 2008 Class III Inventory

Smithsonian Number	Temporary Field Number	Site Type	NRHP Evaluation	Recommendations/ Comments
	MAC-WTT-49	Stone Circles and Cairn	Unevaluated	Avoidance
	MAC-WTT-50	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-51	Stone Circles and Cairn	Unevaluated	Avoidance
	MAC-WTT-52	Stone Circles and Cairn	Unevaluated	Avoidance
	MAC-WTT-53	Cairns	Unevaluated	Avoidance
	MAC-WTT-54	Cairns	Unevaluated	Avoidance
	MAC-WTT-x1	Isolate-non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x2	Isolate- non-diagnostic lithics	Not Eligible	No Further Work
	MAC-WTT-x3	Isolate- non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x4	Isolate- non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x5	Isolate- non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x6	Isolate- non-diagnostic lithics	Not Eligible	No Further Work
	MAC-WTT-x7	Isolate- non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x8	Isolate- non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x9	Isolate- non-diagnostic lithic	Not Eligible	No Further Work

Source: Metcalf 2008b.

The 55 archaeological and historic sites were unevaluated and would require evaluative testing to determine their eligibility for listing on the NRHP. BEPC plans to avoid the unevaluated sites by rerouting the proposed transmission line or by spanning the proposed transmission line over the sites. The results of the inventories conducted in August and September 2008, as well as reroute surveys, were documented in a technical report and submitted to Western, the North Dakota SHPO, and interested tribes. Two sites (32WI1454 and 32WI1969) were previously recorded as being within 75 to 500 feet from the Preferred Route centerline. Both sites, and all other sites would be avoided during construction, or would not require further analysis to determine NRHP eligibility.

Rerouting of the Preferred Route was undertaken to minimize impacts to affected landowners. The rerouted segments totaled 22.08 miles, comprising 535.26 acres within a 200-foot-wide corridor. Results of the Class III survey within rerouted segments are provided in **table 4-12**.

Table 4-12 Archaeological and Historic Resources Located during the 2009 Class III Inventory (rerouted segments)

Temporary Field Number	Site Type	NRHP Eligibility and Management Recommendations
32MN803	Stone circle/cairns	Undetermined/avoidance
32MN804	Stone circle/cairns	Undetermined/avoidance
32MN805	Stone circle	Undetermined/avoidance
32W11057	Stone circle	Undetermined/avoidance
32W11058	Historic occupation	Not eligible
32W11059	Stone circle	Undetermined/avoidance
32W11060	Stone circle	Undetermined/avoidance
32W11061	Stone circle/cairn	Undetermined/avoidance
32W11062	Stone circle	Undetermined/avoidance
32W11063	Stone circle	Undetermined/avoidance
32W11064	School house remnant	Not eligible
32W11065	Stone circle	Undetermined/avoidance
32W11006 update	1 more circle	Undetermined/avoidance
32W11042 update	Historic camp area added	Undetermined/avoidance
32W11044 update	12 more circles	Undetermined/avoidance

A total of 12 sites were recorded and another three sites that per previously recorded were updated. Thirteen sites were classified as undetermined NRHP eligibility; two of the 15 sites were determined to be not eligible under NRHP criteria. All 15 sites would be avoided by either locating structures to areas that would not affect sites or by spanning.

4.7.2 Environmental Consequences

Significance Criteria

- Adverse effects to one or more archaeological or historic sites either listed on or eligible for listing on the NRHP would represent a significant impact; however, adverse effects to these resources could be mitigated through avoidance or appropriate mitigation measures.
- Visual impacts to historic resources could affect the historic context of National Register sites, resulting in a significant impact.

4.7.2.1 Preferred Transmission Line Route and Route Options

Section 106 of the NHPA requires that Federal agencies take into account the effect of an undertaking on historic properties and provide the Advisory Council on Historic Preservation (Council) an opportunity to comment. Historic property, as defined by the regulations implementing section 106, means “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the NPS.” The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet the National Register criteria. Potential impacts to historic properties are assessed using the “criteria of adverse effect” (36 CFR 800.5[a][1]), as defined in the implementing

regulations for the NHPA. “An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.” Adverse effects include not only the physical disturbance of a historic property, but also may include the introduction, removal, or alteration of various visual or auditory elements, which could alter the traditional setting or ambience of the property. The analysis of impacts using the criteria is limited to those resources that are listed in the NRHP or have been recommended as eligible.

A total of 55 archaeological and historic sites and nine isolated finds were recorded during the Class III inventory conducted during 2008 along the original Preferred Route Option. Fifteen additional sites were found or updated along the modified Preferred Route. All of the isolated finds are recommended as not eligible for the NRHP. No further work is recommended for these resources. The NRHP-eligibility of the 55 sites originally identified and 15 sites along the reroute segments, currently is unknown. BEPC would avoid these unevaluated sites by spanning the transmission line over the sites or by rerouting the proposed transmission line. Since the sites would not be affected by BEPC’s Proposed Project, further evaluation to determine eligibility is not required. Therefore, no adverse effects to archaeological or historic resources are expected to occur as a result of BEPC’s Proposed Project. The North Dakota State Historic Preservation Officer reviewed the Class III report and recommended that “no historic properties (would be) affected” and that “no significant sites (would be) affected” by construction and operation of the proposed transmission line (Paaverud 2009). No historic structures were identified that would be visually impacted by the proposed transmission line, regardless of Route Option selected.

4.7.2.2 Previously Undiscovered Resources

Activities associated with constructing BEPC’s Proposed Project could adversely affect previously undiscovered archaeological and historic resources. Class III cultural resource inventories may not locate all sites. Buried sites may be missed in the course of field investigations, or ground cover may conceal evidence of a site. If a previously unknown archaeological or historic resource is encountered during construction of the Proposed Project, BEPC would cease all work within 200 feet of the discovery that might adversely affect the resource and would consult with the appropriate parties to evaluate the discovery. SHPO would be notified immediately (within 24 hours) and would have a qualified archaeologist or a tribal monitor with the proper expertise for the suspected resource type on-site as soon as possible. Construction would not proceed until authorized by SHPO. All archaeological and historic resources would be evaluated using the criteria of eligibility for the National Register of Historic Places established at 36 CFR Part 60.4. Consultation with the appropriate parties (i.e., North Dakota SHPO, interested tribes) would be initiated prior to making the determination. Western would then make a Determination of Eligibility, as required by section 106 of the NHPA and consult with the appropriate parties to determine any mitigation efforts necessary to eliminate or reduce adverse effects. If the site is eligible and further avoidance of the resource is not possible, Western would prepare a Historic Properties Treatment Plan (HPTP) following the guidance provided by the Council in *Treatment of Archaeological Properties* (1980), other standards of the Secretary of the Interior, National Park Service bulletins, and other appropriate Federal guidelines. The HPTP would include a summary of the physical and cultural context, a research design, and treatment measures specifically designed for the resource in question.

The draft HPTP would be submitted to the North Dakota SHPO and interested Tribes for review and comment. All reviewers would respond to the draft HPTP within 21 calendar days of receipt, unless all reviewers agree upon a different time period. Comments received would be incorporated into a revised document. Should any reviewer fail to respond within 21 days, it would be assumed that the reviewer concurs with the HPTP as written.

If construction or other Project personnel identify what they believe to be human remains, they would immediately halt construction at that location and notify the construction or environmental inspector and Western’s Federal Preservation Officer of the discovery. The inspector would notify the archaeological field director or archaeological monitor of the discovery as soon as possible, and then would proceed to ensure that further construction does not occur within 200 feet in any direction of the discovery until further instruction is

received from Western. The inspector also would secure the area of the apparent human remains to ensure no further disturbance or removal of those remains and associated material occurs. The inspector also would ensure that vehicular traffic across the area is restricted to a location removed from the discovery. After arrival at the site, the archaeological field director or archaeological monitor would evaluate the discovery.

Under the provisions of North Dakota law (Century Code § 23-06-27), the discovery of human remains on State or private lands would be reported promptly by Western to the county coroner, the county sheriff, and the North Dakota State Archaeologist. The remains would not be disturbed or removed until reviewed by the State Archaeologist, the State Office of History, Western, and tribes.

4.8 Native American Setting

Specific statutes, regulations, and EOs guide consultation with Native Americans to identify archaeological and historic resources important to tribes and to address tribal concerns about potential impacts to these resources. These include the NEPA, NHPA, AIRFA, NAGPRA of 1990, and EOs 13007, Indian Sacred Sites, and 13175, Consultation and Coordination with Indian Tribal Governments. These statutes and regulations direct Federal agencies to consult with Native American tribal leaders and others knowledgeable about resources that are important to them and their way of life. Consultation is conducted for Federal actions, and can be conducted for applicant actions such as the Proposed Project, that have the potential to affect locations of traditional concern, areas where religious ceremonies are conducted, areas of traditional cultural uses, archaeological sites, and other modern and ancestral tribal resources.

4.8.1 Affected Environment

Northwestern North Dakota and surrounding areas have been traditionally used by Native Americans since pre-recorded time. Ten present-day tribes have ties to the Project area: Eastern Shoshone Tribe, Cheyenne River Sioux Tribe, Northern Arapaho Tribe, Standing Rock Sioux, Northern Cheyenne Tribe, Crow Tribe, Oglala Lakota Nation, Fort Peck Tribes, Rosebud Sioux Tribe, and Three Affiliated Tribes. Nation-to-Nation consultation was initiated by Western.

4.8.2 Environmental Consequences

Western initiated Nation-to-Nation consultation by sending letters to the ten tribes listed above on August 1, 2008. The letter described the Proposed Project and provided the tribes with the opportunity to comment on the Project and identify sites or places that might be of religious or cultural significance to the tribes. The Rosebud Sioux Tribe responded to the letter and has no concerns with the Proposed Project; however, they requested copies of the Class I and Class III inventory reports.

Significance Criteria

- Significant impacts would result from physical damage to cultural, traditional use, religious, or sacred sites or impacts that would reduce the aesthetic quality of Native American resource sites (EO 13007). Loss of access to Native American resource sites or infringement on religious practices of Native Americans (EO 13084) also would result in a significant impact.

4.8.2.1 Preferred Transmission Line Route and Route Options

The Class I cultural resources inventory indicates that previously recorded archaeological and historic resources are located within 75 feet of all three transmission line Route Options. Eight sites are within 75 feet of Route Option A, seven sites are within 75 feet of Route Option B, and nine sites are within 75 feet of Route Option C (Preferred Route). Additionally, several sites were noted to be within 500 feet of Route Options A and B; 26 sites were noted to be within 500 feet of Route Option C (refer to **table 4-10**). Results of the Class III pedestrian inventory indicated that construction or operation of the Preferred Route would not adversely impact known or observed archaeological or historic resources. Furthermore, none of the optional transmission line routes appear to have greater Native American importance than other Route Options. Consequently, construction and operation of BEPC's Proposed Project would not affect resources that are important to Native Americans.

If archaeological or historic resources are discovered during BEPC's construction of the transmission line, work would cease within 200 feet of the discovery and Western would be contacted. The process discussed in section 4.7.2.2 would ensure any discovered archaeological or historic resource or human remains would be properly treated under applicable law.

4.9 Paleontological Resources

Paleontological resources that are located on State lands are protected under North Dakota's Paleontological Resource Protection Act (NDCC 54-17.3) which gives the North Dakota Industrial Commission, acting through the office of the State Geologist, the responsibility to protect paleontological resources that are located on land owned by the State, or its political subdivisions (North Dakota Geological Survey 2007). Resources on private land are not protected under this Act, and are considered property of the landowner.

4.9.1 Affected Environment

Paleontological resources are potentially present in the bedrock in the Project area. The rocks of the Fort Union Group have a high potential for fossils including plants, invertebrates, and vertebrates (mammals and reptiles) (Bureau of Land Management 2006). However, the Preferred Route and Route Options are all predominantly located on surficial deposits, especially glacial deposits, where there is low potential for finding important fossils since glacial processes are not conducive to the preservation of fossils.

4.9.2 Environmental Consequences

Significance Criteria

- Loss of paleontological resources of State-wide importance would represent a significant impact to the resource.

4.9.2.1 Preferred Transmission Line Route and Optional Routes

It is unlikely that paleontological resources would be affected by transmission line construction since there is little bedrock present along the Preferred transmission line route or the Route Options. If paleontological resources are discovered during construction, BEPC would halt work in the area and would notify the North Dakota Geological Survey. Construction of the Proposed Project could result in the discovery of paleontological resources that otherwise would not have been found. Such a discovery could prove beneficial to the scientific community.

4.10 Transportation

Regional transportation facilities, largely consisting of highways and rural roads, would be used to transport construction and maintenance workers, equipment, and materials to transmission line sites. Established roads would be used to the greatest extent practicable. Construction equipment and materials would be transported on overland trails that would be within the ROW to structure sites. Overland trails would generally not be graded.

4.10.1 Affected Environment

BEPC's construction of the Williston to Tioga Transmission Line would require crossing numerous local roads and highways. Route Options A, B, and C would cross the Burlington Northern-Santa Fe Railroad and approximately the same number of local roads and highways.

All three Route Options would be located west of Williston – Sloulin Field International Airport. Sloulin Field provides international service to commercial carriers and general aviation. The main runway is 6,650 feet long and 100 feet wide. Route Option C is east of Tioga Municipal Airport and a private landing strip that is located north of Williston. Tioga Municipal Airport handles commercial and general aviation.

Major highways in the Project area include U.S. Highway 2/U.S. Highway 85 that extends north from Williston; U.S. Highway 2 that extends east-west through Ray, North Dakota; and North Dakota State Highway 40 that is oriented north-south from U.S. Highway 2 to Tioga. Other roads and highways in the Project area are oriented in a north-south, east-west grid along section lines.

4.10.2 Environmental Consequences

Significance Criteria

- Long-term (more than two weeks) disruption of the local transportation network during transmission line construction would represent a significant impact.

4.10.2.1 Preferred Transmission Line Route and Route Options

All three transmission line alignments cross approximately the same number of major local roads and highways. Disruption to local traffic is expected to be minimal, short-term, and temporary and related to the movement of heavy equipment. Construction activities would be carried out over several months; therefore, the intensity of impacts at any one site would be infrequent and short term.

Single-pole transmission line structures, conductor, ground wire, OPGW, and hardware would be trucked to staging areas and/or to structure site locations. Flat-bed trucks would be used to transport structure sections (typically two sections per structure), insulators, hardware, conductor, and OPGW. Truck trips would be spread out to various locations along the transmission line corridor and among the three laydown areas over several months. Equipment would be required for site clearing, structure assembly, hole excavation, conductor and OPGW stringing, and foundation construction, as identified in **table 2-2**. Personal vehicles would transport approximately 70 construction workers to scattered work sites over a six- to eight-month period. Areas where worker activity is most intense are likely to experience localized temporary traffic that could be an annoyance to rural residents. Overall traffic increases also could lead to a small increase in the risk of traffic accidents. Actual impacts associated with each Route Options are similar, due to similarities in the alignments and the road system.

Steps would be taken to reduce potential impacts to traffic during construction. The movement of heavy equipment would comply with applicable U.S. DOT and North Dakota DOT regulations. Local roads and highways that are damaged by construction equipment would be repaired in a timely manner and to county specifications.

Route Options A, B, and C are approximately one mile west of Williston – Sloulin Field International Airport. Engineering analyses indicate that the maximum structure height of the proposed transmission line cannot exceed 130 feet. Design height for the line ranges from 95 to 120 feet (approximately 10 feet below the maximum allowable height). Route Option C would be within one-mile east of Tioga Municipal Airport. Engineering analyses indicate maximum structure height of the proposed transmission line cannot exceed 141 feet. The proposed transmission line (Route Option C) was rerouted to avoid a private landing strip north of Williston. The revised route would be approximately one mile west of the landing strip.

4.11 Socioeconomics

Socioeconomic analyses address potential for impacts to population, housing, and economic viability, particularly to agriculture, as a result of transmission line construction within the Project area. The analyses also include potential impacts associated with the temporary employment of construction workers. BEPC would not require additional permanent personnel for transmission line operations.

4.11.1 Affected Environment

4.11.1.1 Population and Demography

The proposed Williston to Tioga Transmission Project would be located in Williams and Mountrail counties in rural northwestern North Dakota. All but the extreme eastern portion of the Project would be located in

Williams County. According to the U.S. Census Bureau 2000, Williams County has a population of 19,761 residents. The eastern portion of the Project, which includes the Tioga Substation and a small portion of the transmission line route extend east into Mountrail County with a population of 6,631 residents (U.S. Census Bureau 2000).

Racial composition of residents within the two counties is predominantly white; approximately 93 percent in Williams County, and 66 percent in Mountrail County. **Table 4-13** provides demographic information for the towns located in proximity to the proposed Project.

Table 4-13 Local Demographics

Town	County	Population*	Median Household Income**	% Below Poverty Level	
				Families	Individuals
Williston	Williams	12,512	29,962	11.3	13.4
Ray	Williams	534	31,563	2.6	3.7
Tioga	Williams	1,125	29,740	3.5	7.0

* U.S. Census Bureau, American Fact Finder 2000.

** U.S. Census Bureau, American Fact Finder, Census 2000, Income 1999.

4.11.1.2 Economy and Employment

Agriculture is the primary industry, with wheat being the most common crop produced, followed by lentils, barley, oats, dry edible beans and peas, and sugar beets (USDA 2008). Livestock production is the second largest industry, primarily producing beef cattle, and hogs. Service industries and retail trade support residents in the area towns.

The oil and gas industry has been a major economic contributor to the region since the discovery of oil in the Williston Basin in 1951 (Williston 2008). While oil and gas production is concentrated in western North Dakota, the secondary effects (refining and transporting) affects and significantly benefits the entire State's economy (Bangsten & Leistritz 2007).

During the hunting season, the hunting industry provides numerous recreational activities. Recreation in the area includes big game and small game hunting on private and North Dakota Game lands. Big game hunting includes whitetail deer and antelope; small game hunting includes pheasant, and sharptail grouse (Williston Convention and Visitors Bureau 2008).

Additional recreational activities include fishing, bird watching, and canoeing (Williston Convention and Visitors Bureau 2008). Fishing in nearby Lake Sakakawea for walleye and northern pike attract many visitors to the area. Bird watching enthusiasts come to the area for the 365 bird species in the region. Canoeing is a popular recreational activity on the Yellowstone River, Missouri River, and Lake Sakakawea.

4.11.2 Environmental Consequences

Significance Criteria

- Impacts include losses that would jeopardize the economic viability of local agricultural or livestock producers.

4.11.2.1 Preferred Transmission Line Route and Route Options

Construction of the Williston to Tioga Transmission Line would directly affect approximately 96 landowners, regardless of Route Option selected. The proposed Project would not be located within 500 feet of any inhabited rural residences.

Structures that are located within cultivated field would require avoidance by machinery that would result in additional fuel usage and time commitments. The presence of the structures also could result in accidental damage to farm machinery. However, using single-pole structures greatly reduces potential conflicts with farming practices, reduces lands that would be rendered inaccessible by farm machinery, and reduces the effects on farming efficiency.

Mitigation measures available to reduce temporary impacts would include timing construction to avoid the growing season and prompt re-planting of crops. Although cultivated lands would be compacted by machinery operations, temporary impacts would be limited to approximately 2.4 to 8.6 acres within compaction prone soils (refer to **table 4-4**). Additional mitigation measures would include off-setting structures from property lines to allow equipment movement in close proximity to structures. Off-setting would be at the discretion of landowners and through negotiation with BEPC. All structures would be free-standing (self-supporting); guy wires and anchors would not be used. Socioeconomic impacts would be minimized due to the relative absence of long-term impacts to agricultural activities and avoidance of residential structures.

Construction of the proposed transmission line would be completed by BEPC's construction contractors. A total of approximately 70 workers would be needed during the seven-month construction period (**table 2-2**). Workers traveling from outside of the area would require lodging and meals. The communities of Williston and Tioga could see a minimal, short-term beneficial economic impact during construction. Some materials and services would be purchased locally, such as concrete, seed, aggregate, food, fuel, and machinery repair. Impact to housing, population, or community services are not expected as a result of the proposed Project. No long-term beneficial or adverse economic impacts are anticipated from operation of the proposed transmission line project.

4.12 Public Health and Safety

Public health and safety issues range from construction of the proposed transmission line through Project operations.

4.12.1 Affected Environment

Construction, operation, and maintenance of BEPC's proposed Williston to Tioga Transmission Line could result in short- and long-term impacts to public health and safety. Potential health and safety concerns associated with construction include highway and roadway safety associated with the transport of structures, structure hardware, conductor, and personnel and solid waste management. Those associated with operations include electric shock, electric and magnetic fields, stray voltage, and induced voltage. Worker safety issues are associated with Project construction, operation, and maintenance activities. Potential health and safety issues are similar among the three Project Route Options.

4.12.2 Environmental Consequences

BEPC's construction and operation of the proposed Project could affect public health and safety. Transport of heavy equipment and materials would create temporary traffic congestion in some areas, which could potentially affect highway safety. BEPC would be required to remove construction-related materials from construction sites. Long-term health and safety concerns could include electric shock, electric and magnetic fields (EMF), stray voltage, induced voltage, and lightning hazard.

Significance Criteria

- Adverse health impacts from EMF, stray voltage, and induced voltage associated with the operation of transmission lines.

- Serious risk of injuries to workers and the public at large.
- The proposed Project would pose a serious risk of injuries to workers or the public at-large that would be above that of industry standards.

4.12.2.1 Preferred Transmission Line Route and Route Options

BEPC's construction of the proposed transmission line would require the transport of heavy equipment and materials along the length of the proposed Project. Impacts from vehicle movement would be relatively short-term and concentrated within specific areas at structure sites. Construction would take place over a seven-month period. Materials delivery would be carried out during the 7-month construction period. Approximately 70 truck loads would be required for structures and 20 truck loads would be required for insulator and hardware delivery. Large pieces of equipment, such as structure segments, would be delivered directly to work sites along the proposed transmission line corridor. Conductor, groundwire, and OPGW transport would require at least one flat-bed truck for each 10,000 feet of transmission line, totaling 38 to 41 truckloads. Additional truck traffic would be needed to transport materials from staging sites to work sites. Potential impacts to traffic safety would be mitigated by use of pilot cars to accompany oversized loads and slow-moving vehicles. Roads that are damaged due to heavy equipment movement would be repaired by BEPC. The movement of heavy equipment would comply with applicable USDOT and North Dakota DOT regulations. Electric shock is not expected to represent a health and safety issue as conductor heights would be sufficient to allow movement of construction and farm equipment and personnel below the proposed transmission line. Should severe weather damage the transmission line, substation equipment would automatically de-energize the line.

Cause and effect relationships associated between EMF exposure and adverse health effects have not been determined. Some studies have indicated possible connections between exposure and health effects, while other studies have not. Those indicating some sort of linkage have often, if not always, shown no correlation when replicated. EMF levels diminish substantially with increased distance from the conductors, typically reaching background levels within 300 feet of the nearest conductor. Furthermore, occasional exposure to such fields would be short-term and infrequent in this sparsely populated region. Exposures would be far less than those experienced in the home or workplace. Furthermore, the proposed transmission line would be greater than 500 feet from residential or public-use structures.

Stray voltage and induced current occurs on metal objects and along linear features, such as fences that parallel conductors. Neither stray voltage nor induced current are health risks to area residents, since they result in nuisance shocks and both would be completely mitigated by proper grounding.

Potential adverse health effects associated with lightning strikes are minimized by the presence of the combined overhead ground wire and OPGW, which shields the conductors. The current from a lightning stroke is diverted to the ground at the adjacent structure. When the current is discharged from the structure base to the surrounding ground, a step potential voltage can momentarily exist on the ground near the structure, presenting an electrocution hazard. Therefore, people should avoid being near structures during a lightning storm.

Radio reception can be affected by corona affects due to transmission line operations. The severity of such effects are largely a factor of the presence of voltage arcing and distance from the line to the receiver. Corona would be minimized by avoiding damage to conductor during stringing (thus reducing the presence of corona) and by ensuring that hardware is properly installed and connections are tight. Interference with radio reception within the project area is not expected to be a problem because houses and other inhabited buildings would be more than 500 feet from the proposed transmission line.

BEPC would construct and maintain the transmission line in compliance with worker health and safety regulations as prescribed by the U.S. Department of Labor, Occupational Safety & Health Administration, industry standards, and the NESC. Solid and human waste management would be handled by local waste removal firms. All wastes would be transported to approved disposal sites.

4.13 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was signed on February 11, 1994. EO 12898 directs Federal agencies to review proposals and identify, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations to the greatest extent practicable and permitted by law. As such, the proposed Williston to Tioga Transmission Project has been evaluated in terms of adverse effects that:

- a) Are predominately borne by a minority population and/or low-income population; or
- b) Would be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low income population.

4.13.1 Affected Environment

Racial composition of residents within the two counties that constitute the Project area is predominantly white; 93 percent in Williams County and 66 percent in Mountrail County. Approximately 30 percent of residences in Mountrail County are Native Americans who live on the Fort Berthold Reservation, which covers the southern portion of the county. The nearest community to the proposed Project in Mountrail County is Tioga, where the racial composition is 97 percent Caucasian.

4.13.2 Environmental Consequences

Significance Criteria

- Significant impacts would result from a disproportionate impact (or impacts) to minority (including low income) populations (EO 12898).

An analysis of BEPC's Proposed Project impact on minority and/or low-income populations from development of the site is based on census data and land use of the Project site.

4.13.2.1 Preferred Transmission Line Route and Route Options

Racial composition of the residents within both counties is predominantly white and the Fort Berthold Reservation is located well to the south of the proposed Project. Since there are essentially no minority populations that would be impacted, environmental justice is not an issue. While the communities of Williston and Tioga report a higher percentage of individuals below the poverty level (approximately 19 percent) as compared to the North Dakota's State average of 11.4 percent below poverty, BEPC's Proposed Project does not directly affect these communities or those populations. As a result, no adverse impacts to low-income populations would occur as a result of Project development. Construction and operation of the proposed transmission line would not result in proportionately greater impacts to minority populations and/or low-income populations than those to the population as a whole. The Proposed Project passes through sparsely populated areas and has been carefully located to avoid all residential areas.

4.14 Visual Resources Setting

The following discussion describes existing visual resources within the Proposed Project area. Many individuals would describe the visual resources within the Project area as aesthetically pleasing. Scenic quality is based on evaluating the overall character and diversity of landform, vegetation, water, color, and cultural features of a landscape. Additionally, visual resources are evaluated based on viewer sensitivity, which is described as the degree of concern for change in the landscape's visual character. Sensitive viewers include residents and viewers from churches, parks, recreational areas, and roadways. The level of viewer sensitivity is associated with the duration of the view. For example, residents' views of a landscape would be long-term and characterized as those of a highly sensitive viewer; whereas, a motorist's view of the landscape would be short-term in duration and characterized as those of a low- to moderately sensitive viewer.

4.14.1 Affected Environment

The Proposed Project lies within the Missouri Slope Upland Physiographic Region (Bluemle and Biek, not dated), which is part of the Great Plains Province. Elevations range from approximately 2,590 feet amsl to 2,950 feet amsl.

Visual resources in the area include large expanses of cropland and pastureland, interspersed with homesteads, often bordered by shelter belts. Much of the landscape has been modified and used for agriculture.

Colors range from varying shades of greens, soft yellows and browns, depending on the time of year. The broad horizons create a broad spectrum of colors from bright to deep blue's during daylight hours and golds, oranges, and reds at dusk to the west, and dawn to the east.

Two blacktop, two-lane roads mark the landscape from north to south and east to west. U.S. 85/U.S. 2 divides the Project area from the north to the south and is a moderately traveled highway connecting population centers on the north to population centers to the south. The roadway is a primary transportation corridor for rural residents to population centers.

4.14.2 Environmental Consequences

Significance Criteria

- Significant visual impacts to area residents could result from placing the proposed transmission line within 500 feet from inhabited rural residences.

4.14.2.1 Preferred Transmission Line Route and Route Options

Visual resources within the Project area are typically expansive and largely uncluttered by transmission lines, distribution lines, and telephone lines. Installation of a major transmission line would affect the viewshed of many areas. Visual impacts would be most apparent in areas that are frequented by local residents (i.e., near residences, along highways and local roads), and locations where the transmission line would be elevated over surrounding lands. BEPC engineers and ROW specialists made adjustments to the final routing alignment to avoid or reduce visual and other impacts to local landowners. BEPC's decision to use single-pole structures, rather than H-frame structures, further reduces potential visual impacts within the area. Reduced visual impacts are largely related to reduced mass of the single-pole structures.

Construction along roadways would introduce a linear feature that would be obtrusive to some viewers, regardless of the route option. The proposed transmission line would be visible for long distances, due to the relatively flat terrain. However, visibility of the transmission line would decrease with distance. The transmission line structures would be a light gray. Light colored structures tend to become less visible with distance as they fade in with the horizon. Construction would create temporary visual impacts that would remain until vegetation becomes reestablished.

Long-term visual impacts would be reduced by placing structures as far from residential structures as practicable. Placing structures behind shelter belts would further reduce impacts to residential views. Impacts along roadways would be reduced by placing structures along mid-section lines, or off-set into agricultural properties. Placing structures away from intersecting roads and highways would reduce visual impacts to motorists crossing perpendicular to the lines.

Although the transmission line (regardless of option) would be viewed by numerous residents and travelers throughout the area, those from residential structures would be greater than 500 linear feet, thus resulting in minimal impacts. Views along roads and highways also were considered to result in minimal impacts as the Preferred Route is located along the highway ROW and the landscape has been previously altered.

4.15 Noise

Project-related noise would be temporary and limited to that related to construction activities. Operation of the proposed transmission line would not generate appreciable noise levels.

4.15.1 Affected Environment

Ambient noise levels within the Project area are minimal, broken only by the sound of wind and occasional vehicle traffic and farm machinery. Sensitive receptors within the area are largely limited to scattered area residents.

4.15.2 Environmental Consequences

Significance Criteria

- Significant Noise level impacts are those that would create long-term annoyance to area residents.

4.15.2.1 Preferred Transmission Line Route and Optional Routes

Temporary noise impacts would result from BEPC's construction activities, most likely consisting of annoyances such as equipment back-up warning devices and diesel engine operations. Temporary construction noise would be limited to no more than a few days at any particular location and could be mitigated by scheduling work to daytime hours, particularly near sensitive receptors. BEPC's use of single-pole structures, rather than H-frame structures, would reduce construction time needed for boring structure legs by approximately 50 percent. Reduced boring time would decrease the duration of associated equipment noise. The Project would not result in long-term noise annoyances to area residents.

4.16 Air Quality

Air quality parameters typically include consideration of criteria pollutants and prevention of significant deterioration impact levels of nitrogen dioxide, particulate matter, carbon monoxide, and sulfur dioxide.

4.16.1 Affected Environment

The North Dakota Department of Health, Division of Air Quality has determined that the concentrations of the criteria pollutants in the Project area are currently lower than the allowable limits established by the National and State Ambient Air Quality Standards (AAQS). Thus, the area is considered to be in attainment of the AAQS for all pollutants.

4.16.2 Environmental Consequences

Emissions from heavy equipment would result in temporary and localized air quality impacts during construction. Diesel and gasoline engine exhaust would emit hydrocarbons. Moving equipment would increase particulate matter. Operating construction equipment would emit carbon dioxide (CO₂), a greenhouse gas, which has been identified as contributing to global warming. The amount of CO₂ that would be attributable to Project construction would be similar to that being emitted as part of local agricultural activities.

Significance Criteria

- Violation of Federal or State air quality standards would constitute a significant impact.

4.16.2.1 Preferred Transmission Line Route and Route Options

With the exception of trace amounts of ozone, the Proposed Project would not emit air emissions during operations. Air emissions generated by construction equipment (trucks, cranes, auger equipment, etc.) would be temporary and short-term. Therefore, significant impacts to air quality would not occur. Federal and State air quality standards would not be violated as a result of BEPC's Proposed Project.

4.17 Intentional Destructive Acts

Transmission line projects may be the subject of intentional destructive acts ranging from random vandalism and theft to sabotage and acts of terrorism intended to disable the facility. Acts of vandalism and theft are more likely to occur than acts of sabotage and terrorism and most likely to occur in remote areas and at substations. Theft frequently involves equipment and salvageable metal at substations and switchyards. Vandalism often includes shooting out insulators. Sabotage and terrorism would most likely include destruction of key transmission line components with the intent of interrupting the electrical grid.

Intentional destructive acts can result in financial and environmental impacts and impacts to consumers and businesses that rely on power. Financial impacts are ultimately passed on to rate payers. Environmental impacts related to intention destructive acts could range from electrocution of perpetrators, line crews, or the public; wildfire ignition from downed lines; and oil contamination from damaged equipment. Impacts to consumers and business would range from minor annoyance to economic hardship.

Vandalism and theft within substations would be minimized as equipment would be protected by fencing. Little or no preventive measures are available to protect the transmission line from vandalism or sabotage. However, separation of lines would reduce the potential for affecting two or more lines as a result of a single act of sabotage.

4.18 Global Warming

The proposed Project would not measurably contribute to global warming. Fossil fuels would only be consumed for BEPC's initial construction and periodic maintenance purposes. Effects on global warming that would be attributable to the Proposed Project cannot be quantified due to the negligible amount of emissions and the lack of scientific data.