

**APPLICATION TO
NORTH DAKOTA PUBLIC SERVICE COMMISSION
for
ROUTE PERMIT
FOR THE BELFIELD TO RHAME TRANSMISSION PROJECT
(CASE NUMBER PU-07-169)**

by
BASIN ELECTRIC POWER COOPERATIVE

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A. Project Description

A.1 Type

Electrical power transmission improvements are needed in southwestern North Dakota to meet increasing load demands. A systems study concluded that the transmission of additional power to the Rhame, North Dakota, area was the most effective way of meeting future demands. As a result, Basin Electric Power Cooperative (BEPC) proposes to construct and operate a new 230-kilovolt (kV) transmission line and substation to meet existing and future electric power requirements in southwestern North Dakota. The proposed transmission line would transfer power from the Western Area Power Administration (Western) grid at the existing Belfield Substation, near Belfield, North Dakota, to a new substation constructed near Rhame, that would be owned and operated by BEPC. Approximately 55 megawatts (MW) of power would be transferred from the Western grid at the Belfield Substation to the proposed Rhame Substation.

The proposed project would be located in Stark, Slope, and Bowman counties in southwestern North Dakota. The Belfield Substation is located in Stark County, approximately 7 miles southeast of the City of Belfield. The proposed Rhame Substation would be located in Bowman County, approximately 5 miles south of the City of Rhame. A proposed route was identified within a 6-mile-wide corridor from the Belfield Substation to the proposed Rhame Substation site in accordance with North Dakota Public Service Commission (PSC) requirements, as illustrated in **exhibit A-1**.

The proposed 74-mile-long transmission line would be constructed using steel single-pole structures within a 125-foot-wide right-of-way (ROW). In addition to the construction of a new substation near Rhame, North Dakota, minor modifications to the existing Belfield Substation also would occur entirely within the existing substation site. Two new microwave towers also would be constructed as part of the proposed project for communications during transmission line operation; one microwave tower would be constructed adjacent to the proposed Rhame Substation and an additional microwave tower would be constructed on East Rainy Butte.

A.2 Product

Electricity would be transmitted via the proposed transmission line between the Belfield Substation and the proposed Rhame Substation.

A.3 Size and Design

Section A.4.2, Transmission Line Specifications, and section A.4.3, Other Facilities, provide general information regarding the size and design of the proposed transmission line, Rhame Substation and Microwave Tower, and East Rainy Butte Microwave Tower.

A Design Data Report will be provided to the PSC under separate cover, which provides detailed information regarding the size and design of the proposed transmission line. Proposed construction procedures also are described in the following sections.

Engineering and cost analyses were applied to evaluate various transmission line structure designs and materials. Structure design options included single-pole, H-frame, and lattice. Materials considered included steel (galvanized and self-weathering), wood (wood pole), and laminated wood. Factors considered included durability, cost of installation, cost and frequency of periodic maintenance, and potential environmental impacts.

BEPC selected steel single-pole structures for the proposed project because the materials and installation are relatively inexpensive, they can withstand heavy ice and wind loading, and spans between structures can be

longer than those needed for wooden structures. Use of steel single-pole structures also would eliminate the use of guy wires.

A.4 Transmission Line Routing

The proposed route is the result of extensive analysis and strict application of PSC guidelines. In addition, landowner input was considered in all route alignment decisions. **Exhibits B-1** through **B-4** illustrate the proposed route. Details regarding how the routing criteria were applied to each segment of the proposed route are described in **appendix D** and illustrated in **exhibit D-1**.

A.4.1 Right-of-Way and Construction Procedures

A.4.1.1 Pre-construction Surveying and Geotechnical Analyses

Various studies must be completed and permits acquired before construction begins, including an Environmental Assessment (EA) to be completed by Western, cultural resource clearance, biological surveys, and ROW procurement.

BEPC and/or its contractors would perform initial transmission line survey work, consisting of survey control, route centerline location, profile surveys, and access surveys prior to construction. These surveys would likely be conducted concurrently with other pre-construction tasks.

Geotechnical analyses would be conducted at transmission line angle points and other locations to determine engineering requirements for structures. A truck-mounted auger would be transported to each site to drill a small-diameter borehole. Cuttings from each borehole would be evaluated to determine soil characteristics. Geotechnical analyses would be conducted during the winter to minimize impacts to local agricultural activities; land disturbance would be confined to a relatively small area needed for site access and equipment operations. Geotechnical locations would require an area totaling approximately 400-square feet (ft²) in addition to an access trail.

A.4.1.2 ROW Access and Construction Preparation

Crews would gain access from public roads and section line trails as well as within the transmission line ROW for constructing, operating, and maintaining the line. Access for line construction would be by truck travel within the ROW; structure sites located along section lines would be accessed directly from section line roads and trails. New graded surface access roads are not anticipated. Existing roads and trails would be left in comparable or better condition than what existed before construction.

Gates would be installed where fences cross the ROW and locks would be installed at the landowner's request. Gates not in use would be closed but not locked, unless requested by the landowner.

During construction, it is anticipated that three temporary material staging and equipment laydown areas, each averaging approximately 2 to 5 acres, would be used. Two of the three areas would be located within the construction ROW. The third area is an abandoned railroad siding in Griffin, North Dakota. Available lands at the Belfield Substation site and the proposed Rhame Substation site also would be used. Appropriate biological and cultural resource surveys would be conducted before grading any temporary material staging and equipment laydown areas. Staging areas would be re-graded and revegetated when work in the area is complete and the staging area is no longer needed.

Tree and brush removal in the ROW is anticipated to be minimal because the project area consists largely of cultivated cropland and rangeland, and because woodlands associated with drainages were avoided during the routing process. Narrow bands of trees in shelterbelts also were avoided, to the extent practicable, to minimize impacts to wooded areas. The ROW would only be cleared if the trees and/or shrubs present interfere with construction activities or the safe, reliable operation of the transmission line. Trees would be cut at ground level to provide access within the ROW and to allow vehicle access. Stumps and roots would

remain in the ROW unless the landowner requests otherwise. All vegetative materials from clearing activities would either be chipped on site, or removed and disposed of in a permitted facility.

A.4.1.3 Transmission Structure Site Preparation

Transmission structure site clearing would be accomplished using mowers, to the extent feasible. The project area and locations along the proposed route are relatively flat; the need for structure site leveling is expected to be minimal. It is anticipated that at some structure locations, blading of small areas (up to 12 by 25 feet for crane and manlift landings) may be required to level the ground surface to allow the safe operation of the equipment. Blading would be confined to the ROW and accomplished using bulldozers or front-end loaders. Soil removed during leveling would be stockpiled and replaced following construction; special emphasis would be placed on salvaging topsoil to be used for reclamation. The ground would be re-graded to the approximate original contour and revegetated (rangeland) or tilled (cropland) when the work is completed.

A.4.1.4 Borehole Excavation

Crews would use a truck-mounted auger or other special tracked vehicle equipped with a power auger to drill holes for the structures at appropriate locations along the ROW. The total disturbance at each structure location would vary depending on terrain and equipment; however, all disturbance would be confined to the ROW.

Borings for the pole holes would have an average diameter of 4 feet and an average depth of 20 feet. Structures would be lowered by crane into boreholes and the annulus around the pole would be backfilled with excavated material. Surplus material (expected to total approximately 3 cubic yards per structure) would be spread around the area at a depth of approximately 2 to 4 inches or disposed (most likely in the case of cropland) in accordance with landowner specifications.

Structures requiring a reinforced concrete foundation would require a 4- to 6-foot-diameter boring to an average depth of 20 feet. Approximately 8 cubic yards of surplus material would be either spread in the vicinity of the structure or disposed of in accordance with landowner specifications. Disposal of waste material, including concrete spoil, would be in compliance with applicable regulations and would not include placement in wetlands or aquatic sites. Site-specific borehole diameters, depth, and the use of reinforced concrete foundations would be determined during geotechnical engineering evaluations.

A.4.1.5 Structure Assembly and Erection

Structure components (i.e., poles, hardware, insulators, and related materials) would be hauled to structure work site locations and assembled. Insulators and other appurtenances would be attached to the poles while on the ground at each structure location, within the 125-foot-wide ROW. Erection crews would place assembled structures in the boreholes (directly imbedded) or on reinforced foundations (i.e., self-supporting angle point and deadend structures) using cranes or large boom trucks. The structure would then be plumbed and the holes backfilled, as previously described.

A.4.1.6 Conductor Stringing and Tensioning

Following structure construction, crews would install the conductors and an optical groundwire (OPGW) using conductor stringing sheave blocks and line pulling and tensioning equipment. The conductor and OPGW are kept under tension during the stringing process to keep the conductor clear of energized circuits, the ground, and obstacles that could damage the conductor and OPGW surfaces.

Pulling and tensioning sites are typically located at 10,000-foot intervals and at angle point structures. Pulling and tensioning sites at tangent structures are located within the construction ROW while pulling and tensioning sites for angle points are typically located outside of the construction ROW. Each site typically requires two, 37,500-square-foot (0.9 acre) temporary use areas. The temporary use areas would be within the 125-foot-wide ROW along tangent structures. Pulling and tensioning at angle point structures frequently requires land outside of the ROW. The landowner would be compensated for the temporary use of land outside the ROW;

while impacts are expected to be minimal, areas that would be disturbed would be evaluated prior to construction to identify sensitive biological and cultural resources. Disturbed land would be restored to pre-construction conditions, to the extent possible.

Stringing equipment generally consists of wire pullers, tensioners, conductor reels, OPGW reels, and sheave blocks. About 10,000 feet of conductors and OPGW could be installed for each pull. After the conductors and OPGW are pulled for a section of line, they are tightened or sagged to the required design tension in compliance with the National Electrical Safety Code (NESC). The process would be repeated until the OPGW and conductors are pulled through all sheaves. Conductor stringing also would require access to each structure for securing the conductor to the insulators or OPGW to each structure, once final line sag is established.

For public safety and property protection, temporary wooden guard structures would be used to provide temporary support when stringing conductors and OPGW across existing transmission lines, roads, highways, railroads, and other linear obstacles. The structures would be removed when stringing is complete; the pole borings would be backfilled and the temporary support structure sites would be reclaimed. All temporary wooden guard structures would be installed within the construction ROW.

A.4.2 Transmission Line Specifications

The proposed transmission line would be constructed using steel single-pole structures within a 125-foot-wide ROW. The transmission line structures would be approximately 110 feet in height, depending on span distances between structures and area topography. The average span length between structures would be 800 feet; taller structures could be used for crossing existing distribution and transmission lines or where unusual terrain exists. The single-pole structure would be designed to support three conductors and one OPGW, which would be used for communication purposes and also protect the transmission line from electrical outages as a result of lightning strikes. Tangent structures would be free-standing and directly imbedded into the soil. Angle structures (used where the transmission line changes direction) and dead-end structures (used to provide longitudinal stability along the length of the line) would be steel with concrete foundations. Guy wires would not be needed to support these structures.

Project construction would meet the requirements of the NESC for the Heavy Loading District, BEPC design criteria, and other applicable local or national building codes. The Heavy Loading District refers to those areas (including North Dakota) that are subject to severe ice and wind loading. The proposed transmission line would be protected from lightning by the OPGW mounted at the top of the single-pole structures. **Table A-1** describes the typical physical design characteristics for the proposed transmission line, and a typical single-pole structure is illustrated in **exhibit A-2**.

Minimum conductor clearance is measured at the point of greatest conductor sag and closest proximity to the ground. The proposed transmission line would be constructed with clearances that exceed standards set by the NESC. Minimum conductor height would be 26 feet over agricultural land, 28 feet over rural roads, and 31 feet over paved highways.

A.4.3 Other Facilities

The proposed project also includes construction of a new substation, access road, and microwave tower near Rhame, North Dakota (**exhibit A-3**). BEPC purchased 80 acres of land for the substation site. Concrete foundations, support structures and electrical equipment would be installed within a 12.0-acre fenced area for the proposed substation that would include a 2,000 ft² control building and electrical bays, structures, and appurtenances. Construction of the access road would disturb approximately 0.2 acre of land. Modifications to the Belfield Substation would be minor and would occur entirely within the existing substation site.

Table A-1 Transmission Line Characteristics

Design Component	Value
Voltage (kV)	230
ROW width (feet)	125
Average span (feet)	800
Average height of structures (feet)	110
Average number of structures (per mile)	6.6
Temporary disturbance per structure (square feet) (approximately 125-foot x 100-foot area)	12,500
Permanent disturbance per structure (acre) (approximately 3-foot diameter per structure leg)	0.0002
Minimum conductor ground clearance to agricultural land at 100°C (feet)	26
Minimum conductor-ground clearance to rural roads at 100°C (feet)	28
Minimum conductor-ground clearance to paved highways at 100°C (feet)	31
Circuit configuration	Vertical
Conductor size (inches)	1.345

The proposed Rhame Substation site would be cleared and leveled in a manner similar to that proposed for the transmission structures. Aggregate would be spread throughout undeveloped areas within the substation site. Topsoil would be segregated from underlying soils and redistributed on disturbed areas. Soil erosion would be minimized during construction using Best Management Practices (BMPs). Substation components would be hauled to the site on local highways and roads and off-loaded using cranes and similar equipment. Concrete and aggregate from local sources would be hauled to the site via trucks.

A Supervisory Control and Data Acquisition (SCADA) system would interconnect the Belfield Substation and proposed Rhame Substation. Hard-wire system communications would utilize fiber optics within the OPGW between the two substations and microwave communications equipment would be installed for SCADA redundancy and to facilitate voice and data communications by field personnel. A microwave tower and dish would be constructed adjacent to the proposed Rhame Substation and would disturb approximately 0.1 acre of land (**exhibit A-3**). The microwave tower and dish would be approximately the same height as drop structures at the facility. Two microwave dishes would be attached to a 180-foot-tall self-supporting microwave tower that would be constructed on East Rainy Butte (**exhibit A-4**). The proposed microwave tower would be constructed within a 1-acre leased area adjacent to an existing Western microwave tower site and would disturb approximately 0.1 acre of land. A microwave dish would be installed on an existing microwave relay tower on an existing tower at the Belfield Substation. However, modifications to this tower would not be required.

A.5 Time Schedule

Exhibit A-5 illustrates the time schedule for important permitting and construction phases of the proposed project. Construction of the proposed project would likely begin in late 2008. Private contractors would likely construct the proposed transmission line and also would haul away construction wastes associated with the proposed project.

Transmission line construction would generally follow a sequential set of activities performed by crews proceeding along the length of the proposed transmission line. **Table A-2** lists construction activities.

The proposed project would take an estimated 7 months to construct. Additional time for construction has been included in **exhibit A-4** to account for possible delays in construction due to adverse weather conditions. Construction activities associated with the proposed project are estimated to begin during late 2008. It is anticipated that the proposed project would be in-service by early 2010.

Table A-2 Conventional Personnel, Equipment, and Time Requirements for Construction

Task	Number of Personnel	Equipment	Length of Time
Substation Construction			
Substation Grading	6	Dozers, scrapers, motor graders, and water trucks	1–2 months
Substation and Construction Yards and Material Staging	3–4	Pickup trucks, flatbed trucks with cranes, pole delivery trucks, rubber-tire digging equipment, all terrain vehicles (ATVs), portable compressors	Continuous during construction period
Landscape Rehabilitation	4	Pickups, flatbed trucks, backhoe, tractor, seeding equipment, hand-seeding equipment	3 months
Transmission Line Construction			
Structure Site Clearing and Vegetation Management	4–6	Pickups, mower, ATVs	1 month
Gate Installation	3	Flatbed and pickup trucks	1 month
Structure Assembly	6–8	Pickups, cranes, material trucks, rubber-tired crane, 4x4 pickups	4 months
Hole Excavation	2–3	Rotary drilling rigs, backhoes, pickups, rubber-tired digging equipment, ATVs, portable compressors	4 months
Structure Erection	6–8	Rubber-tired cranes, boom trucks, 4x4 pickups	5 months
Ground Wire and Conductor Stringing	16–20	Pickups, manlifts/boom trucks, hydraulic tensioning machines, reel trailers	3 months
Cleanup	4	Pickups, dump trucks, flatbed trucks	Duration of project
Landscape Rehabilitation	4	Pickups, flatbed trucks, backhoe, caterpillar, seeding equipment, hand-seeding equipment	3 months
Concrete Foundations	10	Excavators, concrete trucks, skid steer	1–2 months
Equipment Installation	10	Cranes and trucks	3–4 months
Microwave Tower Construction			
Microwave Tower Foundation Excavation	3	Digger truck	4 days
Microwave Tower Erection	3	Gin pole	2 weeks
Building and Antenna Setting	2-3	Flatbed and pickup trucks	1 week

B. Location

B.1 Policies and Commitments to Limit Environmental Impacts

In addition to the telemetry (SCADA) monitoring system and the mitigation measures, BEPC also adheres to their Environmental Commitment and Compliance policies to limit environmental impacts.

It is the policy of BEPC and its wholly owned subsidiaries to maintain compliance with all federal, state, and local environmental legislation and regulations. BEPC and its subsidiaries recognize the need to maintain a healthy environment for all employees and for citizens in the surrounding areas and commit their support to management in the pursuit of that need.

B.2 North Dakota Century Code, Section 49-22-09

Factors to be considered in evaluating application and designation of sites, corridors, and routes as outlined by the PSC are listed below. The PSC shall be guided by, but is not limited to, the following considerations, where applicable, to aid in the evaluation and designation of sites, corridors, and routes:

1. *Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.*

An EA is currently being completed by Western for the proposed project, which provides detailed information regarding the affected environment and potential impacts that may occur as a result of the proposed project. The following sections provide a summary of the potential impacts to natural and human resources that may occur as a result of construction and operation of the proposed project.

B.2.1 Jurisdictions, Land Use, and Agricultural Practices

B.2.1.1 Proposed Route

Construction of the proposed route would result in temporary impacts to lands during and immediately following construction. Some long-term impacts would result as some land (<0.2 acre) around structures may be inaccessible by farm machinery. Angle structures would be self supporting and would not require guy wires for support. Although self-supporting structures would require reinforced concrete and steel foundations and would be more expensive to install, additional lands required for guy wires would not be needed. The absence of guy wires would eliminate potential conflicts with agricultural operations near the structures and reduce maintenance requirements.

Temporary impacts to land uses have been tabulated in **table B-1**. As shown in **table B-1**, construction of proposed route would result in temporary impacts to 297.3 acres of land, of which 27.0 acres would be developed land (e.g., roads, highways). Roads and highways are crossed by the proposed route but would not be directly affected.

Construction through Private Land Open to Sportsmen (PLOTS) and Conservation Reserve Program lands would adversely affect hunting and conservation resources during, and immediately following construction. Lands disturbed would be restored and revegetated to their pre-construction condition to the extent practicable; however, it is likely that hunting on lands that have been designated for public hunting use (e.g., PLOTS) would be adversely affected for at least one hunting season.

Table B-1 Land Uses Temporarily Impacted by the Proposed Route (acres)

Land Use Types	Proposed Route	
	Percent	Acres
Open Water	0.1	0.3
Developed ¹	9.1	27.0
Barren Land	0.2	0.6
Deciduous Forest	0.0	0.0
Rangeland (Shrub/Scrub)	1.4	4.3
Grassland (maintained pasture)	49.3	146.4
Cropland (Cultivated)	39.1	116.2
Emergent Wetlands	0.8	2.5
Total	100.0	297.3

¹Primarily highways and roads. These features would not be affected by construction activities.

B.2.1.2 Proposed Rhame Substation

BEPC has purchased an 80-acre tract of land, of which 12.2 acres of land would be used for the construction of the proposed Rhame Substation and associated access road. An additional 0.1 acre would be disturbed as a result of microwave tower construction. The construction of these facilities would result in a conversion of cultivated cropland to developed land, which would result in a long-term loss of land used for crop production.

B.2.1.3 Proposed East Rainy Butte Microwave Tower Site

BEPC has leased a 1-acre tract of land, of which 0.1 acre of land would be used for the construction of a self-supporting microwave tower. The construction of this facility would result in a conversion of grassland to developed land, which would result in a long-term loss of vegetative productivity.

B.2.2 Physiography, Topography, Soils, Geology, and Minerals

B.2.2.1 Proposed Route

The proposed route crosses approximately 1.0 mile of the Little Badlands, which are characterized by steep barren hills. Although construction through the Little Badlands is technically feasible, steep slopes and erodible soils could result in construction difficulties and localized erosion could be exacerbated by soil disturbance resulting from heavy equipment movement. Accelerated erosion potential and excess borehole materials could contribute to degradation of surface waters during a storm water runoff event. Approximately seven structures would be required to cross the area. Excavation of a 4-foot-diameter, 20-foot-deep borehole, for a 3-foot-diameter structure leg, would result in approximately 140 cubic feet (ft³) of soil displacement. If excess soils were to be spread around structure site, it would be highly susceptible to transport during a runoff event. The proposed route avoids the most rugged and steep areas. Also, structure locations would be selected to avoid the highly erodible areas.

Soil transport and potential discharge to receiving streams could be reduced by placing excess soils on lowlands that are not in close proximity to streams and drainages. Actual disposal areas would require landowner consent, particularly since they are of minimal agricultural value. Additional mitigation measures include limiting the amount of ground disturbance, to the extent practicable, the use of silt barriers, and the installation of flow barriers. Mitigation measures that would be implemented to minimize impacts to soils are provided in **appendix E**.

Approximately 8.3 acres of prime and unique farmland and 136.2 acres of farmlands of statewide importance would be temporarily affected by construction activities (**table B-2**).

Table B-2 Temporary Impacts to Prime and Unique Farmlands and Farmlands of Statewide Importance (acres)

Prime and Unique Farmlands	Acres
Temporary Impacts to Prime and Unique Farmlands	8.9
Temporary Impacts to Farmlands of Statewide Importance	146.1
Subtotal	155.0
Other Lands	142.3
Total Acres Impacted by Proposed Route	297.3

The majority of impacts to Prime and Unique Farmland and Farmland of Statewide Importance would be temporary and short term. Construction equipment would likely result in soil compaction and/or rutting, particularly along the 12-foot-wide access trail between structures and at structure work site locations where boring equipment, cranes, and trucks would be operating. Although not totally effective, compaction and rutting can be mitigated by cultivation and reseeding. Temporary impacts also could be minimized if construction were to occur during the winter, when soils are frozen. Long-term or permanent loss of important farmlands would be limited to the area (<0.2 acre) that is expected to be occupied by 485 transmission line structures. Actual loss of Prime and Unique Farmland and Farmland of Statewide Importance would be considerably less.

Information received during public scoping indicated that coal mining operations (i.e., South Heart Coal, LLC) could impact lands within Section 28, Township 139 North, Range 98 West. Conflicts with mining operations were avoided by selecting a preferred alignment through Section 29. If constructed, the proposed transmission line through Section 29 would be approximately 0.5 mile west of proposed mining operations. Ongoing coal mining operations near Scranton (Bowman County) are several miles east of the project area and would not conflict with construction of the proposed route.

Sand and gravel, sandstone, and scoria extraction sites are of limited size (generally less than 1 acre each) and in scattered locations. The proposed route was developed to avoid impacts to these localized mineral extraction sites.

Oil production is limited to an area located southwest of Rhame, and is not expected to be affected by the proposed project. The nearest oil and gas production facility is located several miles southwest of the proposed route and proposed Rhame Substation site.

B.2.2.2 Proposed Rhame Substation

Mineral resources are not known to occur nor are minerals extraction activities currently occurring within the 80-acre proposed Rhame Substation site. Therefore, impacts to mineral resources are not anticipated.

The proposed Rhame Substation site is currently used for crop production. Approximately 50 percent of the 80-acre tract is classified by the Natural Resources Conservation Service as Farmland of Statewide Importance. Prime farmland soils are not present on the tract. Substation, access road, and microwave tower construction would require 12.3 acres of land, a portion of which would likely include Farmland of Statewide Importance.

B.2.2.3 Proposed East Rainy Butte Microwave Tower Site

BEPC has leased a 1-acre tract of land, of which 0.1 acre of land would be used for the construction of a self-supporting microwave tower. The construction of this facility would result in a conversion of grassland to developed land, which would result in a long-term loss of soil productivity. The site does not occur within an area leased for minerals extraction. Therefore, impacts to minerals are not anticipated from construction of the microwave tower.

B.2.3 Hydrology and Drainage

B.2.3.1 Proposed Route

Although surface waters would be avoided to the extent practicable, secondary impacts could result from sediment loading to receiving streams. Direct impacts would be avoided by spanning drainages and waterways.

The proposed route would cross minimal flood prone areas as provided in **table B-3**.

Table B-3 Temporary Impacts to Flood Prone Areas (acres)

Flood Prone Area	Area Affected
Zone X500	0.5
Zone AE	1.8
Zone A	7.3
Subtotal	9.6
Other Areas	287.7
Total	297.3

Structures would not be placed within flood prone areas or within streams or channels thereby avoiding impacts to these areas. Flood prone areas, streams, and channels would be avoided or spanned on a case-by-case basis. Access roads would avoid crossing streams and channels. Silt barriers would be constructed to mitigate the potential for sediment loading from disturbed soils, if necessary. Disturbed soils would be revegetated promptly to mitigate sediment transport. **Appendix E** provides detailed mitigation measures that would be implemented to minimize impacts to drainages.

A Storm Water Pollution Prevention Plan (SWPPP) would be developed specifically for the proposed project, which would reduce the potential for off-site transport of soils and contaminants during construction. The SWPPP would identify circumstances in which silt barriers and other containment methods would be used and steps that would be taken to restore disturbed areas.

B.2.3.2 Proposed Rhame Substation

The proposed Rhame Substation site does not include flood prone areas or drainages. A SWPPP would be developed to address steps that would be taken to reduce off-site transport of soils disturbed during construction and off-site transport of contaminants following construction. A Spill Prevention and Response Plan would be developed to reduce the potential for off-site release of contaminants during substation operations. The Plan is particularly important when storing or handling hazardous materials. Containment and clean-up materials would be maintained at work site locations for use if an incidental spill were to occur. Therefore, development of the site is not expected to impact hydrology or local drainage within the area.

B.2.3.3 Proposed East Rainy Butte Microwave Tower Site

BEPC has leased a 1-acre tract of land, of which 0.1 acre of land would be used for the construction of a self-supporting microwave tower. The site does not include flood prone areas or drainages. Therefore, impacts to hydrology or drainage are not anticipated from microwave tower construction.

B.2.4 Vegetation Resources

B.2.4.1 Proposed Route

Vegetation communities that would be disturbed as a result of construction and installation of proposed transmission line are provided in **table B-4**. Approximately 112.5 acres of cropland would be temporarily impacted by transmission line construction. Grassland communities that would be impacted by construction would total 159.6 acres. Although data indicate that approximately 10.2 acres of wetland communities and 2.0 acres of woodland communities would be temporarily affected, most would be either avoided or spanned. Trees and shrubs removed during construction would be replaced two for every one taken.

Table B-4 Temporary Impacts to Vegetation Communities (acres)

Vegetation Community	Vegetation Sub-community	Area Affected
Grasslands	Planted Herbaceous Perennials	90.5
	Prairie – Little Bluestem	11.4
	Prairie – Mesic Tall and Mixed Grasses	9.9
	Prairie – Needlegrass Prairie	18.2
	Prairie – Sand	6.6
	Prairie – Wheatgrass Prairie	23.0
	Subtotal	159.6
Shrub Steppe	Shrubland – Sagebrush	1.7
	Shrubland – Upland Deciduous	7.6
	Subtotal	9.3
Agriculture (cropland)	Subtotal	112.5
Forested	Woodland – Deciduous	0.3
	Woodland – Green Ash	0.8
	Woodland – Mixed Conifer and Deciduous	0.6
	Woodland – Rocky Mountain Juniper	0.3
	Subtotal	2.0
Riparian (wooded wetlands)	Subtotal	0.4
Wetlands	Wetland – Palustrine Seasonal	1.8
	Wetland – Palustrine Semi-permanent	0.5
	Wetland – Palustrine Temporary	7.9
	Subtotal	10.2
Badlands (sparse vegetation)	Subtotal	3.3
Total		297.3

Upon completion of construction, disturbed areas would be revegetated in compliance with the mitigation measures provided in **appendix E**. Timely stabilization of the construction ROW and reseeding with an appropriate seed mix would minimize the duration of vegetation disturbance.

Agriculture

Cropland would typically regenerate quickly after cleanup of the construction ROW. In order to reduce impacts to agriculture, BEPC routed the proposed transmission line along the edges of fields and spanned fields to the extent feasible. Access to the construction ROW would be confined to public roads, section lines, and existing trails.

Grasslands

Temporary impacts to grasslands would occur from disturbance related to construction activities. Long-term impacts to grasslands may occur to grasslands with poor soil and low moisture conditions, since it may take 5 to 7 years for recovery to occur. Planted grasslands would typically regenerate quickly (within 2 years) following cleanup and reseeded of the construction ROW.

Badlands

Long-term impacts may occur to badland vegetation since it may take up to 20 to 30 years to recover due to poor soil and low moisture conditions in these areas.

Shrub Steppe

Long-term impacts may occur to shrub steppe vegetation, such as sagebrush, since it may take up to 20 to 30 years to recover due to poor soil and low moisture conditions in these areas.

Wetlands

No permanent or temporary impacts to wetlands are anticipated as a result of project construction. Consultations with the USFWS and the NDGFD identified concerns about impacts to wetland and native prairie communities (USFWS 2007a; NDGFD 2007a). Structures would not be placed in wetland areas.

BEPC's mitigation measures (**appendix E**) contain wetland mitigation measures that are designed to minimize impacts to wetlands. These measures include:

- Provide a 100-foot buffer zone around wetlands, whenever feasible, to prevent impacts to those ecosystems;
- Spanning all wetland communities;
- Implement mitigation measures to minimize indirect impacts to surface waters and wetland resources, such as erosion and sedimentation controls; and
- The SWPPP and Spill Prevention and Response Plan would reduce the potential for the transport of soils and contaminants during and after construction. The plans would provide protection of wetlands and receiving waters during project construction.

Forested

The removal of trees from localized wooded areas within the construction ROW would result in long-term impacts. In this region, it is anticipated that regrowth of woodlands to mature conditions could take between 50 to 100 years, depending on the species. BEPC would replace trees and shrubs removed during construction at a 2:1 ratio at locations as specified by landowners.

B.2.4.2 Proposed Rhame Substation

The proposed Rhame Substation site is currently used for crop production. Approximately 12.3 acres of cropland would be permanently removed from production with construction of the substation, access road, and microwave tower site.

B.2.4.3 Proposed East Rainy Butte Microwave Tower Site

BEPC has leased a 1-acre tract of land, of which 0.1 acre of land would be used for the construction of a self-supporting microwave tower. The construction of this facility would result in a conversion of grassland to developed land, which would result in a long-term loss of grassland productivity.

B.2.5 Wildlife and Fisheries

B.2.5.1 Proposed Route

Impact analysis focused on wildlife species and associated habitats that may be affected by construction and operation of the proposed project. Methods for establishing a baseline of status, occurrence and associated habitat of wildlife that may occur within the project area include reviewing published literature, natural heritage database information, internet websites, agency correspondence and field surveys. Biologists with the USFWS, NDGFD, and North Dakota Natural Heritage Inventory (NDNHI) were contacted for information about the status of wildlife species, habitat, special wildlife features and habitats in the project area (USFWS 2007b; NDNHI 2007). Initial baseline biological surveys were conducted in the project vicinity in September 2007.

The USFWS recommends the following mitigation measures (USFWS 2007a) in order to minimize disturbances to fish and wildlife resources possibly occurring within the project area:

- Defer the timing of construction to late summer (after July 15) or fall so as not to disrupt wildlife during the nesting season;
- Make no stream channel alterations or changes in drainage patterns;
- Replace trees and 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.

Game Species

Impacts to big game and small game species would include an incremental short-term reduction of forage habitat and an incremental increase in habitat fragmentation within the proposed surface disturbance areas. However, these incremental losses of vegetation would represent only a small percent 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 cases, 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 grasses and woody vegetation were 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) (**appendix E**). In addition, holes that are drilled or excavated for pole placement or foundation construction and left unattended overnight would be marked and secured with temporary fencing to reduce potential for wildlife entering the holes.

Indirect impacts would result from increased human activity and noise levels during transmission line construction. Big game species likely would 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 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) from surface disturbance activities would result in incremental short-term loss of habitat. Habitat fragmentation 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.

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 short-term and animals would be expected to return to the disturbance areas following construction activities.

The Migratory Bird Treaty Act makes it unlawful to take, kill, or possess migratory birds. Habitat alteration and human disturbance 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 avoided by completing a breeding bird survey prior to construction and by following applicable 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). It is recommended that prior to construction, BEPC contact the USFWS for guidance regarding mitigation measures that may be necessary to protect migratory birds.

BEPC does currently plan to construct the proposed transmission line through the nesting period for migratory birds. Prior to surface disturbance activities during the breeding season for migratory birds (April 15 through July 31), a qualified biologist would survey potentially suitable habitat (i.e., non-cultivated land) for nesting activity and other evidence of nesting (e.g., mated pairs, territorial defense, birds carrying nest material, transporting food). If active nests are located, or other evidence of nesting is observed, appropriate protection measures, including establishment of buffer areas and constraint periods, would be implemented until the young have fledged and dispersed from the nest area. These measures would be implemented on a site-specific and species-specific basis, in coordination with Western.

Collision with power lines is a large source of mortality for raptors, waterfowl, and whooping cranes. 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 applicable mitigation measures from Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) and Mitigating Bird Collisions with Power Lines: The State of the Art in 1994 (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 and 20 feet, respectively (see **exhibit A-2**). This spacing of conductors is sufficient to eliminate electrocution impacts to avian species.

Fisheries

BEPC would implement the following mitigation measures (**appendix E**) to reduce impacts to waterbodies crossed by the proposed route minimize impacts to fisheries:

- Spanning all streams and drainages;
- Provide a 100-foot buffer for aquatic habitats whenever feasible;
- Developing a Spill Prevention and Response 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; and
- Establishment of erosion and sediment controls prior to construction, then maintained and controlled throughout restoration.

B.2.5.2 Proposed Rhame Substation

BEPC has purchased an 80-acre tract of land, of which 12.2 acres of land would be used for the construction of a substation and associated access road and 0.1 acre would be disturbed by microwave site construction. The construction of this facility would result in a conversion of cropland to developed land, which would not result in a long-term loss of land used as wildlife habitat.

B.2.5.3 Proposed East Rainy Butte Microwave Tower Site

BEPC has leased a 1-acre tract of land, of which 0.1 acre of land would be used for the construction of a self-supporting microwave tower. The construction of this facility would result in a conversion of grassland to developed land, which would result in a long-term loss of land used as wildlife habitat.

B.2.6 Special Status Species and Noxious Weeds

B.2.6.1 Proposed Route

Wildlife

Impacts to special status 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 and electrocution); 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 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.

Consultation with the NDGFD indicated that the state is concerned about impacts to nongame species associated with native prairie or wetland/riparian habitats. No species-specific surveys would be required for North Dakota Species of Conservation priority occurring within the project area (NDGFD 2007b).

In order to minimize impacts to special status 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

Black-footed Ferret

One prairie dog town covering approximately 28 acres was identified near the project area during the September 2007 field surveys. According to the USFWS' ferret search guidelines from April 1989, prairie dog colonies must be large complexes (at least 80 acres for black-tailed prairie dog towns) and no further than 3 miles apart to sustain a viable population of ferrets (USFWS 1989). In addition, a nonessential/experimental population of black-footed ferrets occurs within the Cheyenne River Sioux Reservation in Ziebach and Dewey counties, South Dakota, which is approximately 190 miles southwest of the proposed project. It would be highly unlikely that individual ferrets from the Cheyenne River Sioux Reservation would be present along the proposed route. In addition, the black-footed ferret is believed to be extirpated from North Dakota (Hagen et al. 2005). Because it is unknown if any prairie dog towns are crossed by the proposed route, construction and operation of the proposed project may affect the black-footed ferret.

According to BEPC's mitigation measures (**appendix E**), prior to construction activities, prairie dog town, black-footed ferret, and burrowing owl occurrence surveys would be conducted by a qualified biologist to

identify any suitable black-footed ferret and burrowing owl habitat within the project area. If applicable, mitigation measures would be implemented, in coordination with Western.

Whooping Crane

The entire project area occurs within the western portion of general migration corridor for the whooping crane. However, based on the number of whooping crane sightings that have been recorded by the USFWS through 2007, approximately 85 percent of whooping crane sightings have occurred within a 120-mile-wide corridor located more than 50 miles east of the project area. The extreme northern portion of the project area is located within the extreme western edge of the migration corridor where an additional 10 percent of the whooping crane sightings have occurred. Therefore, the potential for whooping cranes to occur within the project area during their annual spring and fall migrations would be low.

The proposed project would not affect whooping crane nesting habitat or breeding rookeries. The construction and operation of the proposed project would occur within the whooping crane migratory route and may result in collision impacts. Collision with power lines is the largest source of mortality for whooping cranes. Collision potential depends on 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. Specifically for whooping cranes, collision potential increases when power lines are constructed between suitable wetland roosting habitat and agricultural land utilized for foraging while at a stop-over site. Cranes tend to fly at low altitudes between these two sites, increasing the chances of collisions.

The September 2007 surveys identified several locations in the project vicinity that could be considered suitable stop-over habitat. An additional field survey would be conducted along the proposed route to determine if suitable stop-over habitat for whooping cranes is present. The proposed project could affect migrating whooping cranes.

BEPC's mitigation measures (**appendix E**) available to prevent collision with conductors include following applicable mitigation measures from Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) and Mitigating Bird Collisions with Power Lines: The State of the Art in 1994 (APLIC 1994). In addition, prior to construction activities, surveys for the presence of whooping cranes would be conducted within 1 mile of the project area during the migration periods (April to mid-May and mid-September to October) by a qualified biologist. If whooping cranes are observed during the survey, Western would coordinate with the USFWS regarding additional mitigation that would be warranted.

Gray Wolf

The analysis of the presence of gray wolf in the North Dakota indicates it is likely that individual dispersing wolves from Manitoba or Minnesota may occasionally wander into the project vicinity. In addition, the NDNGLD believes this species to be extirpated from North Dakota (Hagen et al. 2005). Given the infrequency of wolf observations (10 total) in both states from 1981 until 1998 (one observed in 1981, 1985, 1986, 1989, 1990, and 1992; four observed in 1991) (Licht and Fritts 1994), it is highly unlikely that a dispersing wolf would be present within the construction ROW during construction activities. Finally, wolves are relatively secretive and tend to avoid areas of human activity. On the remote chance that a dispersing wolf should approach a site with construction activities, this wide-ranging species would likely avoid the area of disturbance. Therefore, construction and operation of the proposed project is unlikely to have any direct or indirect effects on the gray wolf.

North Dakota Species of Conservation Priority

Black-tailed Prairie Dog

The effects of construction through a prairie dog colony may include temporary loss of forage and shelter due to vegetation clearing, collapsing of burrows, and temporary disruption of foraging and resting activities due to disturbance associated with construction equipment. Direct mortality of prairie dogs could result if active

burrows are occupied at the time of construction. If construction occurs later in the prairie dog's reproductive season (late May to early June), most prairie dogs are expected to be mobile and able to avoid construction traffic; however, some individual prairie dogs may be injured or killed during construction. In addition, there is a chance of destroying active dens with young if construction occurs during the reproductive season.

Only one town covering approximately 28 acres was identified near the project area during the September 2007 field surveys. The proposed project may impact individuals, but is not likely to cause a trend to federal listing or loss of viability of species. According to BEPC's mitigation measures (**Appendix E**), occurrence surveys for prairie dog towns would be conducted prior to construction activities.

Swift Fox

Impacts to breeding swift fox could result from abandonment of den sites and the loss of adults and young from the compaction of dens during project construction. Impacts also could result from the incremental short-term disturbance of grassland habitat until reclamation is completed and native vegetation has become reestablished. Indirect impacts would result from the increased noise levels and human presence related to construction.

Because this species is believed to be extirpated from North Dakota, it is highly unlikely that the proposed project would have any impacts to the swift fox.

Long-eared Myotis, Long-legged Myotis, Western Small-footed Myotis

No historic communal bat roost sites (e.g., hibernacula, nursery colonies, bachelor roosts) have been identified by the NDGFD within the project area. In addition, North Dakota Species of Conservation Priority not associated with native grasslands and wetland/riparian areas are eliminated from further analysis (NDGFD 2007b). Direct impacts to individual bats could occur as a result of crushing by vehicles and equipment during ROW clearing and other project-related construction. Impacts also would result from the incremental long-term reduction of foraging habitat (including habitat fragmentation) until reclamation is completed and native vegetation has become reestablished. Indirect impacts could result from increased noise levels and human presence.

The proposed project may impact individuals, but is not likely to cause a trend to federal listing or loss of viability of species.

River Otter

The proposed project would not include in-stream construction activities and would include a 100-foot buffer from aquatic habitats, where possible (**appendix E**). Construction-related noise may cause temporary displacement of river otters if present in the project area. Because of the limited amount of associated habitat crossed by the proposed route, temporary impacts to individual river otters may occur, but are not likely to cause a trend to federal listing or loss of viability to this species.

Hispid Pocket Mouse

Impacts to the hispid pocket mouse may occur during clearing activities and driving of vehicles within the construction ROW, which may collapse dens and tunnels used by the mouse. Associated habitat for this species is abundant within and adjacent to the project area. Therefore, the proposed project may impact individual Hispid pocket mice, but is not likely to cause a trend to federal listing or loss of viability to this species.

Sagebrush Vole

Impacts to the sagebrush vole may occur during clearing activities and driving of vehicles within the construction ROW, which may collapse dens and tunnels used by the vole. The proposed project may impact individual sagebrush voles, but is not likely to cause a trend to federal listing or loss of viability to this species.

Bald Eagle

Direct impacts on bald eagles during construction could include displacement of individuals to adjacent habitats or damage to occupied and/or unoccupied nests. If construction were to occur during the nesting season, impacts also could include abandonment of eggs or nestlings, injury to or mortality of nestlings, or destruction of eggs. Additionally, construction could affect the availability of the bald eagles' primary food sources, thereby indirectly affecting individual eagles.

Non-nesting bald eagles may be temporarily displaced during construction, but this is not usually considered a significant impact. Individual eagles could find other suitable roosts in the general area until construction activity has passed.

The project area contains minimal suitable bald eagle nesting and no roosting habitat. The proposed route crosses less than 0.5 acre (approximately 0.1 percent) of open water and deciduous forest vegetation, which is potential habitat for the species. Bald eagle nest sites were not identified during the September 2007 field surveys. However, an additional survey would be conducted along the proposed route to identify any bald eagle nests. Therefore, it is unlikely that the proposed project would have any direct or indirect effects on the bald eagle.

The USFWS often recommends measures to minimize the amount and extent of such displacement. Examples of such measures include timing construction to certain portions of the day or having a waiting interval to see if eagles would leave the area on their own accord. Typically, if construction is ongoing and an eagle enters the project activity area, construction would not have to stop.

To reduce impacts to bald eagles within the project area, BEPC plans to complete raptor breeding surveys prior to construction occurring between February 1 and August 15 (**appendix E**). Raptor breeding surveys would be conducted by a qualified biologist through areas of suitable nesting habitat to identify any potentially active nest sites within 1.0 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 Western.

Burrowing Owl

Destruction of burrows could result in displacement of owls into less suitable habitats, increasing susceptibility to predation, reducing cover or forage habitat, or reducing reproductive success. Displacement, injury, or direct mortality could result if active burrows are occupied at the time of ground disturbing activities.

One prairie dog town covering approximately 28 acres was identified near the proposed route during the September 2007 field surveys. An additional field survey would be conducted along the proposed route to determine if prairie dog colonies are present (**appendix E**). The proposed project may impact individuals, but is not likely to cause a trend to federal listing or loss of viability of species.

Golden Eagle, Ferruginous Hawk, Swainson's Hawk, Northern Harrier, Peregrine Falcon, Prairie Falcon, Short-eared Owl

Impacts to these migratory bird raptor species are discussed in section B.2.5.1. According to BEPC's mitigation measures (**appendix E**), 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 potentially 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 Western.

American Avocet, American Bittern, Willet, Wilson's Phalarope

Impacts to these migratory bird species are discussed in section B.2.5.1.

Canvasback, Northern Pintail, Redhead

Impacts to these migratory bird species are discussed in section B.2.5.1.

Grasshopper Sparrow, Lark Bunting, LeConte's Sparrow, Loggerhead Shrike, Long-billed Curlew, Dickcissel, Chestnut-collared Longspur, Brewer's Sparrow, Bobolink, Black-billed Cuckoo, Marbled Godwit, Baird's Sparrow, McCown's Longspur, Red-headed Woodpecker, Sprague's Pipit, Upland Sandpiper

Impacts to these migratory bird species are discussed in section B.2.5.1.

Greater Sage Grouse

Direct impacts of construction on sage grouse may include the loss of lekking grounds and other sage grouse habitat. Although the proposed project would result in minimal permanent loss (0.2 acre) of habitat along the construction ROW, the regeneration of sagebrush would likely be slow. Depending on the timing of construction, the proposed project could impact sage grouse during lekking activities or brood rearing, and could cause displacement, injury, or direct mortality of individuals. Sage grouse are particularly sensitive to disturbances while they gather on lekking grounds each morning and evening from early March to early May. Construction activities and associated noise occurring in early morning and late evening in the vicinity of lekking grounds could disrupt and displace sage grouse that have gathered for breeding activities. In addition, once breeding activities have concluded, sage grouse hens create their nests on the ground underneath sagebrush plants in proximity to the lekking grounds. The proposed project could impact nesting sage grouse by destroying nests, causing nest abandonment, or causing injury or direct mortality to the young.

Indirect impacts may include the degradation of habitat by the construction of the proposed transmission line and infrastructure, which provide additional hunting perches for raptors (NDGFD 2007a). Perch deterrents would be installed to minimize impacts in areas where increased predation would be a concern according to BEPC's mitigation measures (**appendix E**).

The proposed route crosses suitable sagebrush habitat. However, NDGFD and the NDNHI did not identify any lek sites along the proposed route. The NDGFD would not require greater sage grouse surveys prior to construction, but do recommend avoiding sagebrush habitat to the extent possible (NDGFD 2007a).

Sharp-tailed Grouse

Direct impacts of construction on sharp-tailed grouse may include the loss of lekking grounds and other sharp-tailed grouse 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. Sharp-tailed grouse are particularly sensitive to disturbances while they gather on lekking grounds each morning and evening from early March to early May. Construction activities and associated noise occurring in early morning and late evening in the vicinity of lekking grounds could disrupt and displace sage

grouse that have gathered for breeding activities. The proposed project could impact nesting sharp-tailed grouse by destroying nests, causing nest abandonment, or causing injury or direct mortality to the young.

Individual sharp-tailed grouse were identified in the project vicinity during the September 2007 field surveys. The proposed project may impact individuals, but is not likely to cause a trend to federal listing or loss of viability of species.

Common Snapping Turtle, Plains Spadefoot

Direct impacts to these reptile species could result in mortalities of these less mobile or burrowing reptile species due to surface disturbing activities (e.g., crushing by vehicles and equipment). According to BEPC's mitigation measures (**appendix E**), all wetland and riparian communities would be spanned by the proposed transmission line. In addition, a 100-foot buffer for wetlands, riparian areas, and aquatic habitats would be provided whenever feasible. The proposed project may impact individuals during construction, but is not likely to cause a trend to federal listing or loss of viability of species.

Northern Sagebrush Lizard, Short-horned Lizard, Western Hognose Snake.

Direct impacts to these reptile species could result in mortalities of these less mobile or burrowing reptile species due to surface disturbing activities (e.g., crushing by vehicles and equipment). Indirect impacts would include the loss of associated vegetation during clearing activities. Although the proposed project would not result in a permanent loss of habitat along the construction ROW, the regeneration of sagebrush associated with these reptile species would likely be slow.

The proposed project may impact individuals, but is not likely to cause a trend to federal listing or loss of viability of species.

Northern Redbelly Dace, Flathead Chub

Clearing of vegetation within the construction ROW could increase erosion along stream banks and turbidity levels in the waterbodies, as well as cause localized changes in water temperature and light penetration, which could affect aquatic habitat, primary and secondary production, and fish use patterns. Indirect impacts could occur if soil transport were to affect such locations and degrade habitat. In addition, pollutants from hazardous substance spills and herbicide use could contaminate fisheries crossed by the proposed route.

No in-stream construction activities would occur during project construction. According to BEPC mitigation measures (**appendix E**), the transmission line structures would be designed so that streams and drainages would be spanned and remain undisturbed. In addition, BEPC would develop a SWPPP to minimize sedimentation impacts to waterbodies and a Spill Prevention and Response Plan to prevent the potential for spills of hazardous substances to waterbodies. 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. Herbicides used to control noxious weeds would be applied in accordance with label instructions.

Actual impacts to Northern redbellied dace and the flathead chub are expected to be negligible as their habitats would be avoided or spanned by the proposed transmission line.

Special Status Plants

Alkali Sacaton, Bent-flowered Milkvetch, Narrow-leaved Wirelettuce, Slim Flowered Scurfpea, Torrey's Cat's-Eye, White Locoweed

Impacts to special status plant species identified as potentially occurring along the proposed route 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 could occur from construction activities. However, mitigation measures would be implemented to control noxious weeds (**appendix E**).

The proposed project may impact individuals, but is not likely to cause a trend to federal listing or loss of viability for these plant species.

Sensitive Ecological Communities

Impacts to sensitive ecological communities identified as potentially occurring along the proposed route could include loss of vegetation as a result of trampling from construction vehicles and equipment, and clearing and construction of transmission line components. In addition, invasion of suitable habitat by noxious weeds could occur from construction activities.

According to BEPC's mitigation measures (**appendix E**), existing native vegetation within the construction ROW would be preserved whenever feasible. In addition, surface disturbance areas would be reclaimed using native species and would be planted at the appropriate times, as recommended by agencies or landowners, to reestablish native vegetative cover and minimize the potential for invasion by noxious weeds.

Noxious Weeds

Noxious weeds, if not controlled, can displace native plant species, rendering infested areas unproductive. They can 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. Mitigation measures would include implementing weed control measures prior to construction and after reclamation to avoid the spread of noxious weeds. If noxious weeds are introduced to the project area, remediation actions would be taken to physically remove or chemically eliminate problem species. Areas disturbed during construction would be monitored for a minimum of three growing seasons to ensure that noxious weeds have not been established.

BEPC's mitigation measures (**appendix E**) to reduce the introduction of noxious weeds would include implementing weed control measures prior to and after construction. These measures would include the following construction and restoration procedures:

- Coordinating with the appropriate local, state, and federal 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;
- Ensure any soil imported for agricultural or residential use has been certified as weed-free, unless otherwise approved by the landowner;
- Ensure that the contractor would 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
- Monitor restoration of disturbance areas and identify populations of noxious weeds for 3 years following reclamation.

B.2.6.2 Proposed Rhame Substation

The 80-acre Rhame Substation property is currently in cultivation. Small mammals and reptiles would likely be displaced during construction, but would return to 67.7 acres of habitat that would not be developed following construction activities. Habitat would be eliminated from the 12.3 acres of land with the construction of the substation, access road, and microwave tower site. There are no known special status species to be present on the 80-acre substation property. The proposed Rhame Substation site is not within a sensitive ecological community. Noxious weed control measures would be implemented as described in **appendix E**.

B.2.6.3 Proposed East Rainy Butte Microwave Tower Site

BEPC has leased a 1-acre tract of land, of which 0.1 acre of land would be used for the construction of a self-supporting microwave tower. Impacts to special status species or invasion by noxious weeds are not anticipated as a result of construction or operational activities with the implementation of mitigation measures as specified in **appendix E**.

B.2.7 Archaeological and Historic Resources

B.2.7.1 Proposed Route

Section 106 of the National Historic Preservation Act of 1986 (NHPA) requires that federal agencies take into account the effect of an undertaking on historic properties and provide the Advisory Council on Historic Preservation 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 of Historic Places (NRHP) criteria. Potential impacts to historic properties are assessed using the “criteria of adverse effect” (36 Code of Federal Regulations [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.

As a result of a files search, a total of four previously recorded sites (i.e., 32BO0978, 32BO0961, 32BO0966, 32BO0270) were located within 500 feet of the proposed route; one of the four sites (32BO0978, Puckett Farm) also is located within 75 feet of the proposed route. The site currently is unevaluated and requires additional archival research to determine its eligibility for the NRHP. The remaining three sites include two ranches and a historic cultural material scatter/depression/foundation. The two ranches are unevaluated and the historic scatter/depression/foundation was recommended by the field archaeologist as not eligible for the NRHP.

A Class III pedestrian survey was conducted along the proposed route from October 31 to November 7, 2007. The survey area consisted of a 200-foot-wide corridor centered on the proposed route centerline and the proposed Rhame Substation site. With the exception of approximately 3 miles where access was denied from the landowner, the entire proposed route was inventoried for cultural resources.

A total of 11 sites and 8 isolated finds were identified during the Class III inventory. The 11 sites consist of 4 prehistoric lithic scatters, two historic farmsteads, one historic homestead, and a historic bridge, dump, railroad, and stock pen. Bifaces and flakes are included in the isolated finds. Of the 11 sites, 9 are recommended by the field archaeologist as not eligible for the NRHP and 2 are unevaluated at this time. The two unevaluated sites include a historic railroad and a prehistoric lithic scatter. Evaluative testing would be needed to determine the eligibility of these two sites. However, the railroad would be spanned by the proposed transmission line, thus avoiding any impact to the site, and the prehistoric lithic scatter is located outside of the project area and would be avoided by project construction. Therefore, no further work (i.e., testing) is recommended for these two sites.

Activities associated with constructing the proposed project could adversely affect previously undiscovered prehistoric and historic sites. Cultural resources inventories may not locate all sites. Buried sites may be missed in the course of field investigations. If a previously unknown cultural resource is encountered during project construction, all work within 200 feet of the discovery that might adversely affect the cultural resource would cease until Western, in consultation with the appropriate parties, could evaluate the discovery. Western would be notified immediately (within 24 hours) and would have a cultural resource specialist 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 Western.

Upon arriving at the site of the discovery, the cultural resource specialist would assess the resource. The assessment would include the nature of the resource, the spatial extent of the resource, and the nature of deposition and exposure. If the site is determined to be damaged, a site damage assessment report would be written by the cultural resource specialist for review and comment by Western, North Dakota State Historic Preservation Officer (SHPO), and Tribes.

The cultural resource specialist also would complete a North Dakota Archaeological Site Form (available at <http://www.nd.gov/hist/hp/PDFinfo/NDCRSArchaeologicalForm.pdf>) that includes basic information on how and when the discovery was made. All Archaeological Site Forms would be sent by the cultural resource specialist to Western, which would send the forms to the North Dakota SHPO and Tribes for review and comment.

All cultural resources would be evaluated using the criteria of eligibility for the NRHP established at 36 CFR Part 60.4. Consultation with the appropriate parties (i.e., North Dakota SHPO, interested Native American groups) 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 Advisory Council on Historic Preservation (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 cultural resource in question.

Western would submit the draft HPTP 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. Western would incorporate the comments into a revised document. Should any reviewer fail to respond within 21 days, Western would assume 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 a construction or environmental inspector and Western's Federal Preservation Officer or Western's Upper Great Plains Region archaeologist of the discovery. The inspector would notify the cultural resource field director or cultural resources 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 a cultural resource specialist arrives to assess the discovery. 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 cultural resource specialist would evaluate the discovery.

The discovery of human remains on state or private lands would be reported promptly to Western. Western, under North Dakota State Law (Chapter 23-06-27) shall, "as soon as practicable (within 24 hours), report the presence or discovery of the burial, remains, or goods to the local law enforcement agency with jurisdiction in the area in which the burial, remains, or goods are located". "Upon having received notification of the actual or potential disturbance or the discovery of a human burial site, human remains, or burial goods pursuant to 23-06-27, the local law enforcement agency so notified shall, as soon as practicable, report the receipt of such notification to the Historical Society of North Dakota and to the Department of Health and Consolidated Laboratories. Based upon the information received by the law enforcement agency from the person providing such notification, the agency shall additionally inform the society and the department of the exact location and

state of the human burial site, human remains, or burial goods of which notification was received" (North Dakota State Law 40-02-03[03]).

Once human remains are confirmed, Western would then implement internal procedures for complying with Native American Graves Protection and Repatriation Act (NAGPRA). NAGPRA [43 CFR §10.4(d)(iii)] requires notification within 3 days to affiliated Tribal members.

NAGPRA [43 CFR §10.4(c)] requires that the federal activity that resulted in the inadvertent discovery of human remains should cease for a maximum of 30 days and the remains should be secured and protected, "including, as appropriate stabilization or covering." [43 CFR §10.4(d)(ii)]

NAGPRA [43 CFR 10.4 (d)(v)] states that, if the human remains, funerary objects, sacred objects, or objects of cultural patrimony must be excavated or removed, follow the requirements and procedures in 10.3 (b) of NAGPRA.

B.2.7.2 Proposed Rhame Substation

The Class I cultural resources investigation indicates that archaeological or historic sites have not been previously found on the proposed Rhame Substation site. Cultural resources were not observed during the Class III pedestrian survey that was conducted within the proposed Rhame Substation site. Therefore, impacts to cultural resources are not anticipated from construction. However, if archaeological resources are identified during construction, construction activities within the area would cease and the SHPO would be notified. Construction would not occur in the area without clearance from the SHPO.

B.2.7.3 Proposed East Rainy Butte Microwave Tower Site

Cultural resources were not observed during a Class III pedestrian survey that was conducted within the proposed disturbance area. Therefore, impacts to cultural resources are not anticipated from construction. However, if archaeological resources are identified during construction, construction activities within the area would cease and the SHPO would be notified. Construction would not occur in the area without clearance from the SHPO.

B.2.8 Native American Setting

B.2.8.1 Proposed Transmission Line

Tribes that were contacted by Western showed little to no interest in the proposed project and did not provide information pertaining to the presence (or absence) of traditional cultural use areas within the project area. Therefore, impacts to traditional cultural use areas and areas that are considered sacred to the tribes are not anticipated.

Results of a Class III pedestrian survey indicated that construction or operation of the proposed project would not adversely impact known or observed cultural resource sites. If archaeological resources or human remains are discovered during construction of the transmission line or other surface disturbance areas, work should cease in the vicinity of the discovery and Western would be contacted. **Appendix E** provides specific mitigation measures that would be implemented for these resources.

B.2.8.2 Proposed Rhame Substation Site

A Class III pedestrian survey indicated that archaeological or historic sites do not within the proposed Rhame Substation site. Also, the proposed site does not include traditional cultural use areas or areas that are considered sacred to the tribes. Therefore, impacts to traditional cultural use areas and areas that are considered sacred to the tribes are not anticipated as a result of construction activities.

B.2.8.3 Proposed East Rainy Butte Microwave Tower Site

A Class III pedestrian survey indicated that archaeological or historic sites do not occur within the proposed microwave tower site. Also, the proposed site does not include traditional cultural use areas or areas that are considered sacred to the tribes. Therefore, impacts to traditional cultural use areas and areas that are considered sacred to the tribes are not anticipated as a result of construction activities.

B.2.9 Paleontological Resources

B.2.9.1 Proposed Route

Construction of the proposed transmission line could result in direct impacts to paleontological resources. Specific locations of known resource locations have not been identified; however, it is likely that they would be most abundant within rocky substrate associated with buttes and exposed aggregate of the Little Badlands and outcroppings of other formations. Formations that are known to have paleontological resources that are crossed by the proposed route include the White River Group, Golden Valley Formation, Sentinel Butte Formation, and Bullion Creek Formation (Bluemle 1988, 1977). Mitigation measures, as described in **appendix E**, would include completing a field survey for paleontological resources within the construction ROW and other surface disturbance areas in exposed rock areas associated with these formations. In addition, monitoring for paleontological resources would occur during construction activities if paleontological resources are observed in these areas. Although it is unlikely that construction would affect paleontological resources of state-wide importance, if such resources are discovered during construction, work in the area should be halted and the North Dakota Geological Survey would be notified.

B.2.9.2 Proposed Rhame Substation

The proposed Rhame Substation site is cultivated land and there is no exposed bedrock that would provide substrate for paleontological resources. Furthermore, the land is under private ownership; if paleontological resources are present on the site, they would not be afforded legal protection.

B.2.9.3 Proposed East Rainy Butte Microwave Tower Site

Potential impacts to paleontological resources as a result of construction activities would be avoided or minimized with the implementation of the mitigation measures provided in **appendix E**.

B.2.10 Transportation Network

B.2.10.1 Proposed Route

The proposed route crosses 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 at crossing sites where temporary wooden guard structures would be installed to facilitate line stringing. The guard structures would be installed by boring structure leg holes near the roadway and installing the structures and cross-members to support conductors and the OPGW during pulling and tensioning. Actual disruption to local traffic patterns would be minimal, consisting of temporary delays. Road closures would not be required. Transmission line installation at railroad crossings would be similar to those of road crossings, but would not impact rail movement. Soils displaced while boring holes for the guard structure legs would be used to back-fill around the legs and used as fill when the structure is removed.

Structures, conductors, OPGW, and hardware would be hauled to staging areas and/or to structure site locations using trucks. A total of 70 truckloads would be required for the structures and 20 truckloads would be required for the hardware, insulators, wire, and other supplies.

Equipment would be required for site clearing, structure assembly, hole excavation, conductor and groundwire stringing, foundation construction, and construction of the proposed Rhame Substation. Personal vehicles would transport approximately 70 construction workers to scattered work sites over a 6- to 8-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 increased numbers of traffic accidents. Implementation of the mitigation measures provided in **appendix E** would minimize impacts to the transportation network within the project area.

B.2.10.2 Proposed Rhame Substation

The Rhame Substation site is adjacent to County Major Collector (CMC) 619. Construction equipment and materials would be hauled to the site using CMC 619 and major highways. Although potential suppliers have not been identified, it is likely that much of the equipment and materials would be transported on Interstate 94, U.S. Highway 12, and U.S. Highway 85. Potential impacts to local traffic patterns would likely result in temporary delays. Impacts to local traffic could be mitigated by scheduling to avoid peak traffic periods and pilot cars, if required by law, could be used to escort oversized loads.

B.2.10.3 Proposed East Rainy Butte Microwave Tower Site

The construction of this facility would not affect the transportation network within the project area due to the limited number of vehicles and equipment that would be used for construction.

B.2.11 Socioeconomic Values

B.2.11.1 Proposed Route

Construction of the proposed transmission line would directly affect approximately 105 landowners. Detailed routing completed by BEPC engineers and lands specialists resulted in the identification of the proposed route, which would be greater than 500 feet from an inhabited structure.

Structures that are located within cultivated fields would require avoidance by farm machinery that would result in minimal additional fuel usage and time commitments. The presence of the structures also could result in accidental damage to farm machinery. Although soils that could be compacted by construction machinery operations, temporary impacts would be limited to approximately 297.3 acres and tilling could offset related impacts. The proposed route includes alignment revisions as suggested by landowners to minimize impacts within cropland areas. Turning structures (i.e., points of inflection) would be free-standing (i.e., self supporting); guy wires would not be used.

Construction of the proposed transmission line would be completed by contractors. A total of approximately 70 workers would be needed during the 7-month construction period. Workers traveling from outside of the area would require lodging and meals. The communities of Belfield, Dickinson, and Bowman could see a minimal, short-term beneficial economic impact during construction. Some materials and services would be purchased locally, such as concrete, seed, aggregate, and machinery repair. Impacts to housing, population, or community facilities and services are not expected as a result of the proposed project.

Public Health and Safety

Energized transmission lines can induce current along parallel fencelines and can be the source of stray voltage. Although induced current and stray voltage can be a nuisance, it does not constitute a life-threatening condition. BEPC would install appropriate grounding to reduce the possible occurrence for either event.

Mitigation measures also would be implemented to reduce potential television and radio interference caused by transmission line operations. Care would be taken to avoid damage to conductors and to ensure that conductor hardware is properly installed and secure to reduce the possibility of corona effect. Mitigation measures to address television and radio interference would be addressed on an as-needed basis; those associated with reducing potential corona effect would be part of transmission line construction.

Detailed routing completed by BEPC engineers and lands specialists resulted in the identification of the proposed route, which would be greater than 500 feet from an inhabited structure thereby avoiding long-term exposure to electric and magnetic fields from the proposed transmission line.

B.2.11.2 Proposed Rhame Substation

A maximum of 67.7 acres of the proposed Rhame Substation site would be temporarily disturbed during substation construction and line construction to the Montana Dakota Utilities Transmission Line. The substation, access road, and microwave tower site would permanently occupy approximately 12.3 acres. Lands that would be temporarily affected would be restored following construction and could be returned to agricultural productivity. The long-term loss of productivity on 12.3 acres of cropland would result in a negligible impact to the agricultural community as a whole.

No inhabited structures are located within 500 feet of the proposed Rhame Substation. The nearest inhabited structures would be more than 0.5 mile from the site. Impacts to housing, population, or community facilities and services are not expected as a result of the proposed project.

B.2.11.3 Proposed East Rainy Butte Microwave Tower Site

BEPC has leased a 1-acre tract of land, of which 0.1 acre of land would be used for the construction of a self-supporting microwave tower. No inhabited structures are located within 500 feet of the site.

B.2.12 Environmental Justice

B.2.12.1 Proposed Route

Racial composition of the residents within all three counties is predominantly white; therefore, no impacts to a minority population would occur as result of construction or operation of the proposed project. While the communities of Belfield and Rhame report a higher percentage of families and individuals below the poverty level (approximately 19 percent) as compared to the North Dakota's state average of 11.4 percent below poverty, the proposed project does not directly affect these communities. As a result, no 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 impacts to minority populations and/or low-income populations.

B.2.12.2 Proposed Rhame Substation

Impacts to Environmental Justice concerns would be the same as described for the proposed route.

B.2.12.3 Proposed East Rainy Butte Microwave Tower Site

Impacts to Environmental Justice concerns would be the same as those described for the proposed route.

B.2.13 Visual Resources

B.2.13.1 Proposed Route

Visual resources within the project area include expansive views that are largely uncluttered by man-made features. Installation of a major transmission line would adversely affect the viewshed of many areas. Visual impacts would be most apparent in areas that are frequented by local residents (i.e., nearby residences, along highways, and local roads), and locations where the proposed transmission line would be elevated over surrounding lands. Construction across the Little Badlands would be most noticeable to viewers on 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.

Construction along roadways would introduce a linear feature that would be obtrusive to some viewers. The proposed transmission line would be visible for long distances, due to the relatively flat terrain. However, visibility of the proposed transmission line would decrease with distance. Also, the transmission line structures would consist of galvanized steel. Light-colored structures tend to become less visible with distance as they fade in with the horizon. Construction disturbance 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. 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 minimize visual impacts to motorists crossing perpendicular to the proposed transmission line.

No historic structures were identified that would be visually impacted by the proposed transmission line. Although the proposed transmission line would be viewed by numerous residents and travelers throughout the area, those from occupied residential structures would be greater than 660 linear feet, thus resulting in minimal impacts. Views along roads and highways also were considered to result in minimal impacts as viewer duration would be short-term, and in many cases peripheral.

B.2.13.2 Proposed Rhame Substation

Construction of a new substation along CMC 619 would result in adverse visual impacts along one of the main highways to Rhame. Although the existing Rhame Substation (located approximately 2 miles south of the proposed substation site) would be dismantled, visual impacts associated with the new facility would be greater. The new facility would occupy a larger area, require more electrical interconnections and would include a 2,000 ft² control building and 180-foot-tall microwave tower. The proposed Rhame Substation and microwave tower would not be visible from residential structures. Therefore, visual impacts to occupants are expected to be minimal.

B.2.13.3 Proposed East Rainy Butte Microwave Tower Site

The construction of a 180-foot-tall microwave tower may be visible from occupied residences within 1 to 2 miles from the site and people traveling on public roads within the project vicinity. However, impacts to visual resources would be minor since several microwave towers are present immediately adjacent to the proposed site.

B.2.14 Noise

B.2.14.1 Proposed Route

Temporary noise impacts would result from 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 daylight hours, particularly near sensitive receptors.

B.2.14.2 Proposed Rhame Substation

Construction of the proposed Rhame Substation would result in a temporary increase in noise levels at the site. Residents of a house located approximately 0.5 mile to the east and a house approximately 1.0 mile to the north would hear heavy equipment noise. Increased truck traffic along local roads also would result in temporary impacts local residents. Adjustments to work schedules could mitigate such impacts.

B.2.14.3 Proposed East Rainy Butte Microwave Tower Site

Noise generated from the construction of the microwave tower would be localized and would not be audible from the nearest residences, which are approximately 1 to 2 miles from the site.

B.2.15 Meteorology and Air Quality

B.2.15.1 Proposed Route

Air quality effects associated with transmission line construction activities are temporary air emissions (primarily tailpipe emissions) from combustion engines used to power construction equipment, and fugitive dust from soil disturbance and vehicle travel. There are no long-term air quality concerns with operation of transmission lines since they would not generate air emissions. In addition, maintenance activities would be conducted infrequently, would be widely disbursed, and would rely on travel using pickup trucks.

Air quality in North Dakota is regulated at the state level by North Dakota Department of Health – Division of Air Quality (NDDH-DAQ) under federal delegation. The NDDH-DAQ regulation 33-15-17 applies to any source of fugitive emissions and prohibits fugitive dust emissions that would:

- Exceed the ambient air quality standards of Chapter 33-15-02 at or beyond the property line of the source;
- Exceed the PSD air quality increments at or beyond the property line of the source for sources subject PSD;
- Exceed the restrictions on the emission of visible air contaminants, at or beyond the property line of the source; and
- Would have an adverse impact on visibility, on any Class I federal area.

Construction and operation of transmission lines also would not require a pre-construction air quality permit because the de minimis threshold of 2 tons per year that would trigger an air quality permit, as defined in North Dakota Regulation 33-15-17, would not be reached.

Direct short-term air emissions during construction would be generated from fossil fuel combustion from the construction equipment and vehicles, such as haul trucks, boom trucks, drill rigs, numerous pieces of earth-moving equipment, flatbeds, water trucks for dust suppression, and pickup trucks. These are collectively referred to as mobile sources. Tailpipe emissions from mobile sources generate particulate matter (predominantly the fine fraction PM_{2.5}), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO₂), and volatile organic compounds (VOCs) from gasoline and diesel fuel use.

The CO emitted by mobile sources also contributes to carbon dioxide (CO₂) greenhouse gas (GHG) emissions. The total CO₂ emissions from all combustion sources in North Dakota in 2004 was approximately 47 million metric tons of gross CO₂-equivalent emissions. This was less than 1 percent of total U.S. GHG emissions. Electricity generation (excluding electricity exported to other states) and transportation were the primary sources of GHG emissions, with approximately 65 percent and 13 percent of North Dakota's GHG emissions, respectively. Residential, commercial, and industrial fuel use accounted for 18 percent of GHG emissions (USEPA 2008). Because constructing the transmission line would represent a fraction of the total transportation sources within the state (less than 0.1 percent), the effects of construction-associated CO₂ emissions are considered less than significant.

Direct short-term air emissions during construction also would be generated from soil disturbances for ROW preparation, clearing vegetation, grading, preparation of transmission structure sites, and similar clearing and grading activities for substation construction and upgrades. Soil disturbances and construction traffic on unpaved access roads generate particulate matter (predominantly the coarse fraction PM₁₀) in the form of fugitive dust. The amount of fugitive dust generated is a product of the silt and moisture content of the soil, frequency of rainfall, wind speed, vegetation removal, traffic volumes and speeds, and BMPs at the construction site. Fugitive dust from construction would be localized, settling out in the area surrounding each transmission structure or substation construction site, staging areas, and roadways. Fugitive dust would be greatest during drier summer and autumn months and in fine-textured soils.

To act as a dust suppressant, the construction contractor would remove the least amount of vegetation necessary to allow for construction and would scarify and reseed exposed areas after construction. During construction, water trucks would apply water as another dust suppressant, particularly on unpaved access roads and the aprons where construction traffic meets a paved road.

North Dakota air quality rules regulating fugitive dust emissions apply to clearing land and construction activities. They require reasonable precautions to prevent dust from becoming airborne, including the use of water or chemical suppressants to control dust where possible, and covering open-bodied trucks when in motion while transporting materials likely to produce airborne dust. They also require prompt removal of earth

or material from paved roads and streets. In addition, opacity from fugitive dust cannot equal or exceed 20 percent.

In general, construction activities would be expected to generate localized, short-term increases in concentrations of certain criteria pollutants from mobile sources that would be well below levels exceeding a state air quality standard. Fugitive dust from construction activities would be mitigated as described in **Appendix E**. There would be no long-term air quality effects associated with the proposed transmission line.

B.2.15.2 Proposed Rhame Substation

Air quality effects associated with substation construction activities are similar to those described for the proposed route, with temporary air emissions (primarily tailpipe emissions) from combustion engines used to power construction equipment, and fugitive dust from soil disturbance and vehicle travel. No long-term air quality concerns would occur with operation of the substation since it would not generate air emissions.

B.2.15.3 Proposed East Rainy Butte Microwave Tower Site

Impacts to air quality would be the same as described for the proposed Rhame Substation and transmission line construction.

2. *The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.*

BEPC would use self-supporting electric transmission line structures without the use of guy wires for support. Steel single-pole structures would be used instead of H-frame structures, which would result in less permanent disturbance. Also, the construction of the proposed Rhame Substation would eliminate the need for the existing Rhame Substation, which would be removed from operation after the proposed Rhame Substation became operational. The proposed microwave towers that would be constructed adjacent to the proposed Rhame Substation and on East Rainy Butte would be self-supporting structures.

3. *The potential for beneficial uses of waste energy from a proposed energy conversion facility.*

Not applicable.

4. *Adverse direct and indirect environmental effects, which cannot be avoided should the proposed site or route be designated.*

To the extent practicable, all effects from the construction and operation of the proposed transmission line, Rhame Substation, associated access road, and microwave towers within the proposed corridor would be mitigated. With the exception of the proposed Rhame Substation, transmission line structures, and microwave tower sites, all other lands that would be disturbed during construction would be returned to the current land use. Construction of the substation, access road, and microwave tower would result in the long-term loss of 12.3 acres of cultivated cropland and soil productivity. Construction of transmission structures and the East Rainy Butte Microwave Tower site would result in the permanent loss of <0.2 acre and 0.1 acre of land, respectively. No other permanent direct or indirect adverse effects are anticipated.

5. *Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.*

No alternative locations for the proposed facilities have been identified at this time. Alternatives may be identified during the public hearing process.

6. *Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.*

Irreversible and irretrievable commitments of natural resources would include the permanent loss of vegetation and soil productivity at the proposed Rhame Substation, access road, and microwave tower (12.3 acres), structure locations (<0.2 acre), and Rainy Butte microwave tower site (0.1 acre). No other irreversible or irretrievable commitments of natural resources would occur from project construction and operation. All areas of natural vegetation within the ROW would be reclaimed with agency-recommended or landowner-specified seed mixtures, wetlands would be avoided, and minimal agricultural land would be taken permanently out of production.

7. *The direct or indirect economic impacts of the proposed facility.*

Economic impacts would be positive. Ad valorem taxes would be paid annually, which help the economy. North Dakota sales or use tax would be paid on all materials purchased. During construction, workers would increase the level of business activity in the area.

8. *Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.*

Proposed developments within the proposed corridor include a lignite mine/power plant project and an airport relocation project.

South Heart Coal, LLC has proposed the development of lignite mining and a coal gasification plant southeast of the Belfield Substation. If developed, the mine would likely impact several square miles of agricultural land. Impacts from this proposed project would be long-term and would likely affect biological, cultural, socioeconomic, and visual resources within the area.

Although a plan of development is not available for the proposed mine and power plant, assumptions have been made based on similar operations elsewhere. Mining operations would likely require removal and stockpiling of topsoil, excavation of lignite resources and surface restoration that would permanently change surface uses, biological resources, and surface hydrology. Heavy equipment would be brought to the site on public roads, which could create temporary transportation impacts. Coal handling would be confined to the property boundary, but would likely require transport to the plant site by truck, dedicated rail line, or conveyor system. The proposed route is located adjacent to the mine lease area and would not affect the future development of this mine.

Although a site for the proposed new Bowman County Airport has not been identified, it would be located in the vicinity of the proposed project. The new airport would likely occupy approximately 1 square mile of cropland and/or pastureland. Airport property would be fenced and would include a terminal, hangers, runway marking features, storage tanks, and other structures that would change the visual character of the area. The facility also would result in the loss of wildlife habitat, cultural resources, and the loss of agricultural lands.

9. *The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.*

Detailed information related to the potential effects to these resources has been provided in the Visual Resources, Archaeological and Historic Resources, and Paleontological Resources subsections in Section B.2, North Dakota Century Code, Section 49-22-09.

10. *The effect of the proposed site or route on areas which are unique because of the biological wealth or because they are habitats for rare and endangered species.*

The proposed route crosses wetlands and wooded areas in localized areas. A total of 52 special status wildlife species and 6 special status plant species potentially occur along the proposed route. However, impacts to these species are not anticipated to these species with the construction of the proposed project and implementation of BMPs and mitigation measures.

Of the 58 special status species, 3 are federally listed and may require surveys prior to construction activities. They include the black-footed ferret, gray wolf, and whooping crane. The remaining 55 special status species are state-listed and would not require any additional surveys (NDGFD 2007b).

11. *Problems raised by federal agencies, other state agencies, and local entities.*

To date, no problems have been indentified by federal, state, or local agencies. Federal and state agencies were contacted during the data collection phase of the proposed project. These agencies have provided input and identified concerns that have been addressed in this document. The federal, state, and local agencies that were contacted are provided in **appendix B**, Notification. **Appendix C**, Agency Correspondence, is a compilation of correspondence letters and telephone call summaries. **Appendix D** provides a summary of issues identified during public scoping meetings that were held in Belfield and Bowman, North Dakota in July 2007 as part of the public involvement process as required for the EA. In addition, **appendix D** includes refined routing comments, transmission line routing descriptions, and a figure (**exhibit D-1**) illustrating route adjustment areas that were incorporated into the proposed route to address landowner concerns.

B.3 Proposed Route Location Criteria

The locations of the proposed route and proposed Rhame Substation are illustrated in **exhibit A-1**. The criteria used to develop the proposed route location within the corridor are illustrated in **exhibits B-1** through **B-12**.

B.4 Proposed Route Selection Criteria

The proposed transmission line must originate at the Belfield Substation and terminate at the proposed Rhame Substation. The criteria identified and illustrated in section B.3 were used to define a proposed route between these two points. These criteria are difficult to list in order of importance in terms of relative value as they are closely interrelated. They were of equal value and importance in the route selection process. The selection criteria are discussed in the following sections.

B.5 North Dakota Public Service Commission Criteria

Exclusion and avoidance areas as defined by the PSC have been inventoried for the proposed route and are illustrated on **exhibits B-1** and **B-8**. The proposed route alignment within the proposed corridor avoids impacts to exclusion and avoidance areas. Throughout the route suitability evaluation process, PSC selection and policy criteria, design and construction limitations, and economic factors have been considered. These criteria are summarized in sections B.5.1 through B.5.6.

B.5.1 Exclusion Areas

Exclusion areas are defined as geographical areas that are to be completely avoided during transmission line routing. Buffer zones of reasonable distance are to be applied to each exclusion area; natural screening may be considered in determining the extent of the buffer zone. **Exhibits B-1** through **B-4** illustrates the exclusion areas that occur within the proposed corridor and along the proposed route.

1. *Designated or registered national: parks, memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas.*

None would be crossed by the proposed route.

2. *Designated or registered state: parks, historic sites; monuments; historical markers; archaeological sites; and nature preserves.*

None would be crossed by the proposed route.

3. *County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions.*

None would be crossed by the proposed route.

4. *Areas that are critical to the life stages of threatened or endangered animal or plant species.*

None would be crossed by the proposed route. Detailed information regarding threatened and endangered species has been provided in the Special Status Species subsection in Section B.2, North Dakota Century Code, Section 49-22-09.

5. *Areas where animal or plant species that are unique or rare to the State would be irreversibly damaged.*

None would be crossed by the proposed route. Detailed information regarding state rare species has been provided in the Special Status Species subsection in Section B.2, North Dakota Century Code, Section 49-22-09.

B.5.2 Avoidance Areas

Avoidance areas are defined as geographical areas that are to be completely avoided during transmission line routing, unless the applicant shows that under the circumstances, there is no reasonable alternative. In determining whether an avoidance area should be designated for a facility, the applicant may consider, among other things, the proposed management of adverse impacts; the orderly siting of facilities; system reliability and integrity; the efficient use of resources; and alternative routes. Economic considerations alone shall not justify approval of these areas. Buffer zones of a reasonable distance shall be included, unless a distance is specified in the criteria. Natural screening may be considered in determining the width of the buffer zone. **Exhibits B-5** through **B-8** illustrate the avoidance areas that occur within the proposed corridor and along the proposed route.

1. *Designated or registered national: historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.*

None would be crossed by the proposed route.

2. *Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands.*

None would be crossed by the proposed route.

3. *Historic resources that are not specifically designated as exclusion or avoidance areas.*

None would be crossed by the proposed route.

4. *Areas that are geologically unstable.*

One fault would be crossed by the proposed route. However, impacts are not anticipated since this is an inactive fault that would be spanned by the proposed transmission line (U.S. Geological Survey 2008).

5. *Areas within 500 feet of a residence, school, or place of business (also to include community centers, healthcare facilities, and daycare facilities).*

Residences, schools, and places of business are not located within 500 feet of the proposed route.

6. *Reservoirs and municipal water supplies.*

None would be crossed by the proposed route.

7. *Water sources for organized rural water districts.*

None would be crossed by the proposed route.

8. *Irrigated land.*

None would be crossed by the proposed route.

9. *Areas of recreational significance that are not designated as exclusion areas.*

None would be crossed by the proposed route.

B.5.3 Selection Criteria

In selecting its proposed route, BEPC has attempted to minimize potential impacts to all environmental resources (**exhibits B-9 through B-12**). Several resources are specifically identified in the PSC selection criteria. Steps that BEPC proposed to take to minimize impacts to the selection criteria are discussed in the following sections.

1. *Agricultural production.*

The project area is predominantly used for agricultural production, which could not be avoided.

2. *Family farms and ranches.*

The project area is predominantly used for agricultural production. Family farms and ranches could not be avoided during the routing process. Impacts to family farm and ranch operations were minimized through discussions with landowners and adjustments to the proposed route alignment.

3. *Land that the owner can demonstrate has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation.*

Lands suitable for irrigation have not been identified at this time. These areas would be identified and avoided to the extent practicable and through negotiations with landowners.

4. *Surface drainage patterns and groundwater flow patterns.*

Hydrology and drainage are discussed in the Hydrology and Drainage subsection Section B.2, North Dakota Century Code, Section 49-22-09.

5. *Noise-sensitive land uses.*

Noise sensitive land uses are discussed in the Noise subsection in Section B.2, North Dakota Century Code, Section 49-22-09.

6. *The visual effect on the adjacent area.*

Potential effects to visual resources are discussed in the Visual Resources subsection in Section B.2, North Dakota Century Code, Section 49-22-09.

7. *Extractive and storage resources.*

The proposed South Heart lignite mining site is located within the proposed corridor. However, the proposed route would not cross the site and would not affect any future mine development.

8. *Wetlands, woodlands, and wooded areas.*

These areas are discussed in the Vegetation Resources subsection in Section B.2, North Dakota Century Code, Section 49-22-09.

9. *Radio and television reception, and other communication or electronic control facilities.*

These facilities are discussed in the Socioeconomic Values-Public Health and Safety subsection in Section B.2, North Dakota Century Code, Section 49-22-09.

10. *Human health and safety.*

Operation of the proposed transmission line and substation would generate low electromagnetic fields (EMFs) within close proximity of these facilities. Based on recent studies that have been conducted, the overall scientific evidence for human health risk from EMF exposure is inconclusive (National Institute of Environmental Health Sciences 2002). Since the project area is sparsely populated and people would have infrequent, short-term exposure to low levels of EMFs during operation, potential impacts to human health are not anticipated. A chain-link fence would be constructed along the perimeter of the proposed Rhame Substation thereby preventing access to electrical appurtenances and electrical hazards within the site.

11. *Animal health and safety.*

EMFs generated by the proposed transmission line and substation would not likely affect animal health since animals would have infrequent, short-term exposure to low levels of EMFs during operation. Surface water, frequently utilized by animals, would be protected from contamination with the implementation of the BMPs and mitigation measures provided in **appendix E**. A chain-link fence would be constructed along the perimeter of the proposed Rhame Substation thereby preventing access by most terrestrial wildlife species to electrical appurtenances and electrical hazards within the site.

12. *Plant life*

Impacts to plant life would be limited to the disturbed portions of the proposed transmission line ROW and substation. Approximately 38 percent of the land along the proposed route is cultivated cropland. Construction within these areas would not affect native vegetation. Rangeland disturbed during construction activities would be reclaimed with agency-prescribed seed mixes or seed mixes provided by landowners. Reclamation of these areas would restore vegetation and reinstate the native habitat.

B.5.4 Policy Criteria

The PSC may give preference to an applicant that would maximize benefits that result from the adoption of the following policies and practices, and in a proper case, may require the adoption of such policies and practices. The PSC also may give preference to an applicant that would maximize interstate benefits.

1. *Location and design.*

The proposed route was selected to avoid sensitive resources to the extent possible, as described in sections B.5.1 through B.5.3. Detailed information regarding project design and project components have been described in sections A.4.2 and A.4.3.

2. *Training and utilization of available labor in North Dakota for the general and specialized skills required.*

Transmission line and substation construction would require special skills and equipment. The construction contractor would be encouraged to use local labor, when possible.

3. *Economics of construction and operation.*

BEPC has attempted to maximize the economics of the construction and operation of the proposed project by locating the proposed transmission line between two fixed points in a relatively straight line and avoiding topographic and cultural resource features.

4. *Use of citizen coordinating committees.*

None were believed appropriate for this type of project.

5. *A commitment of a portion of the transmitted product for use in North Dakota.*

Power would be purchased by Upper Missouri Electric Cooperative and Slope Electric Cooperative, which are local energy suppliers.

6. *Labor relations.*

Union and non-union construction contractors would bid on the proposed project. The construction contract would be awarded to the lowest qualified bidder. Transmission line, substation, and microwave tower construction would require special skills and equipment. The construction contractor would be encouraged to use local labor, when possible.

7. *The coordination of facilities.*

The existing Belfield Substation would be used to interconnect with the Western transmission line. The proposed project would terminate south of Rhame and would interconnect to Montana-Dakota Utilities' transmission line and the 115-kV transmission system.

8. *Monitoring of impacts.*

Monitoring of revegetated areas would be completed for 2 years following construction to evaluate revegetation success and 3 years to identify any noxious weed populations.

9. *Utilization of existing and proposed ROWs and corridors.*

The proposed route was selected to maximize the potential use of existing highways, roads, and section lines.

10. *Other existing or proposed transmission facilities.*

Not applicable.

B.5.5 Design and Construction Limitations

In order to serve the intended functions of transmitting electricity from the Belfield Substation to the southwestern North Dakota area, the proposed transmission line must originate at the Belfield Substation and terminate in the Rhame area.

B.5.6 Economic Considerations

BEPC is committed to constructing the proposed transmission line, substation, and microwave towers as economically as possible while strictly adhering to the PSC’s criteria. The anticipated construction cost for installation of the proposed transmission line, Rhame Substation, and microwave towers within the proposed corridor is \$33 million; annual operation costs are estimated at approximately \$27,300 per year for the transmission line and approximately \$29,460 per year for the proposed Rhame Substation.

B.6 Mitigative Measures

Construction specifications would be designed to minimize potential impacts from transmission line, substation, and microwave tower construction. Certain impacts may not be entirely avoidable, but could be mitigated to reduce the severity and longevity. Mitigation measures for the proposed project have been provided in **appendix E**.

B.7 List of Preparers and Qualifications

This application for a Route Permit was prepared by ENSR, BEPC, and Metcalf Archaeological Consultants. The qualifications of the individuals who participated in the preparation and review of this application are provided in **table B-5**.

Table B-5 Qualifications of Application Preparers

Company and Person	Responsibilities	Education and Experience
ENSR Corporation - Fort Collins, Colorado		
Jon Alstad	Route Permit Application Manager	M.S. Range Science B.S. Animal Science A.A. Liberal Arts 19 Years Experience
George High	Project Manager	B.S. Biology 34 years experience
Peggy Roberts	Assistant Project Manager, Public Involvement Specialist	BJ Journalism/PR MS Public Communications (in progress) 10 years experience
Patricia Lorenz	Biological Resources	B.S. Wildlife Biology 5 Years Experience

Table B-5 Qualifications of Application Preparers

Company and Person	Responsibilities	Education and Experience
Kim Munson	Cultural Resources	M.A. Anthropology B.A. Anthropology 16 Years Experience
Merlyn Paulson	GIS	B.L.A. Landscape Architecture M.L.A. Landscape Architecture 33 Years Experience
Brent Read	GIS	B.S. Forestry Science M.S. Watershed Science 5 Years Experience
Susan Coughenour	Technical Editor	Two Years General Studies 24 Years Experience
Basin Electric Power Cooperative – Bismarck, North Dakota		
Duey Marthaller	Project Manager	M.S. Civil Engineering B.S. Civil Engineering 29 Years Experience Registered Professional Engineer
Kevin Solie	Environmental Analyst	M.S. Geology B.S. Geology B.S. Geological Engineering (in progress) 17 Years Experience
Mike Murray	Right-of-Way	A.A. Business Administration Various Courses through International ROW Association SR/WA (Senior ROW designation) 8 Years Experience
Phil Novak	Right-of-Way	Various courses through International ROW Association 20 Years Experience
Joyce Novak	Right-of-Way	Various courses through International ROW Association 20 Years Experience
Curt Pearson	Corporate Communications	B.S. Business Administration M.B.A. Certified Cooperative Communicator 30 Years Experience
Metcalf Archaeological Consultants – Eagle, Colorado		
Patrick O'Brien	Cultural Resources	M.A. Anthropology B.A. Anthropology 16 Years Experience

B.8 Maps

Detailed maps of the proposed transmission line, Rhame Substation, and microwave tower sites have been provided in the Exhibits section and the engineering report with drawings will be provided under separate cover.

B.9 Permits, Licenses, Approvals, and Consultation Requirements

Permits, consultations, and approvals would be required from various federal and state agencies, which would include:

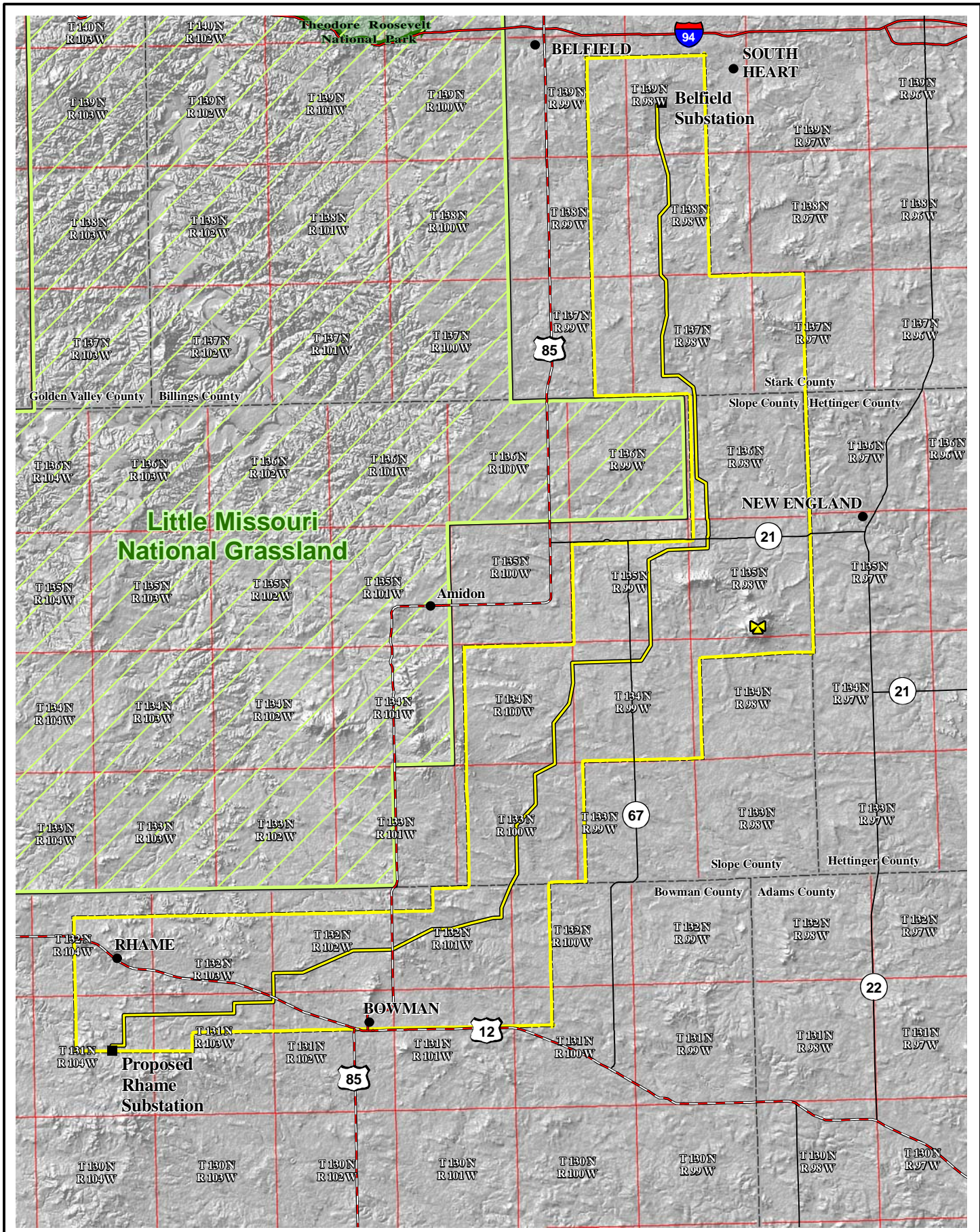
- North Dakota Public Service Commission – Certificate of Corridor Compatibility and Route Permit;
- Western – System Interconnection Authorization, compliance with the National Environmental Policy Act and Native American Consultation;
- USFWS – Compliance with the ESA (Section 7 consultation), compliance with the Migratory Bird Treaty Act;
- State of North Dakota Historic Preservation Office – Compliance with the National Historic Preservation Act (Section 106 consultation);
- Federal Highway Administration – Permit to construct and operate a transmission line across or within ROWs;
- Federal Aviation Administration – Aeronautical study with a determination of hazards and requirements for painting and/or lighting;
- Federal Communications Commission – Agency may require registration and lighting of tower less than 200 feet tall;
- North Dakota Department of Transportation – Permit to construct and operate a transmission line across or within ROWs;
- Burlington Northern–Santa Fe Railroad – Authorization to construct and operate a transmission line across railroad ROWs.
- NDGFD – Consultation to identify any state-listed species of concern that could potentially be affected by the proposed project; and
- North Dakota Department of Health – Acquire SWPPP Permit, if required, for construction of the proposed Rhame Substation.
- Bowman County – Acquire Zoning Permit.

B.10 References

- Avian Power Line Interaction Committee (APLIC). 2006. R. Harness, contributing author to: *Suggested Practices for Avian Protection on Power Lines: State of the Art in 2006*. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, California.
- _____. 1996. *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996*. Edison Electric Institute and the Raptor Research Foundation. Washington, D.C.
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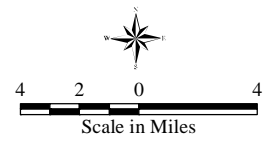
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- U.S. Fish and Wildlife Service (USFWS). 2007a. North Dakota Field Office to N. Stas, Western Area Power Administration, Billings, Montana. July 24, 2007.
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- U.S. Fish and Wildlife Service (USFWS). 1989. Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act. Denver, Colorado and Albuquerque, New Mexico. April 1989. 10 pp.
- U.S. Geological Survey. 2001. National Land Cover Database (NLCD). Zone 45 Land Cover Layer. Edition 1.0 Sioux Falls, South Dakota.
- _____. 2008. National Atlas Database. <http://nationalatlas.gov/natlas>.

Exhibits



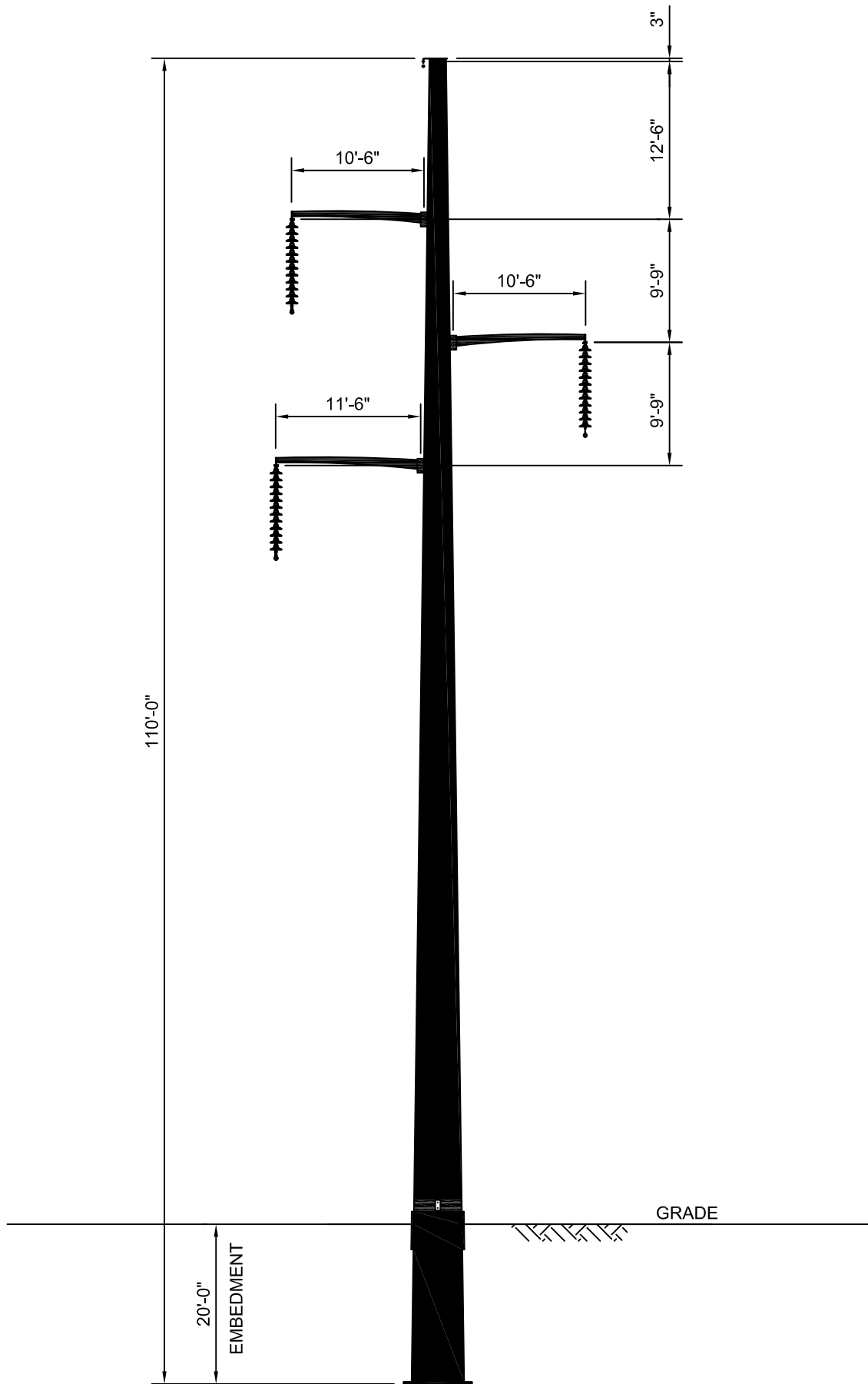
LEGEND

- Proposed Route
- Proposed Corridor
- National Park
- National Grassland
- Proposed Microwave Tower
- Substation
- Township
- City or Town

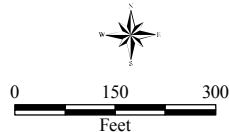
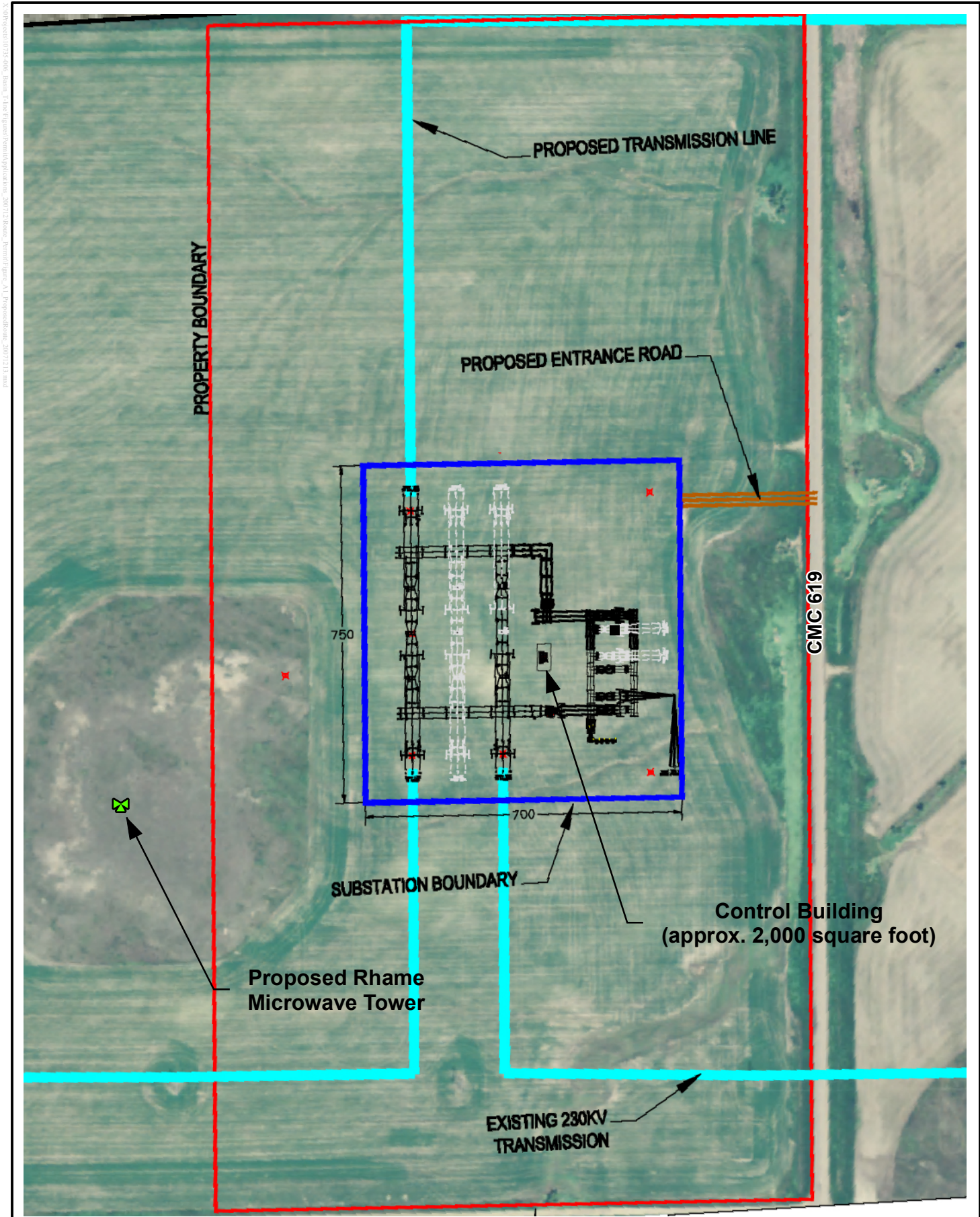


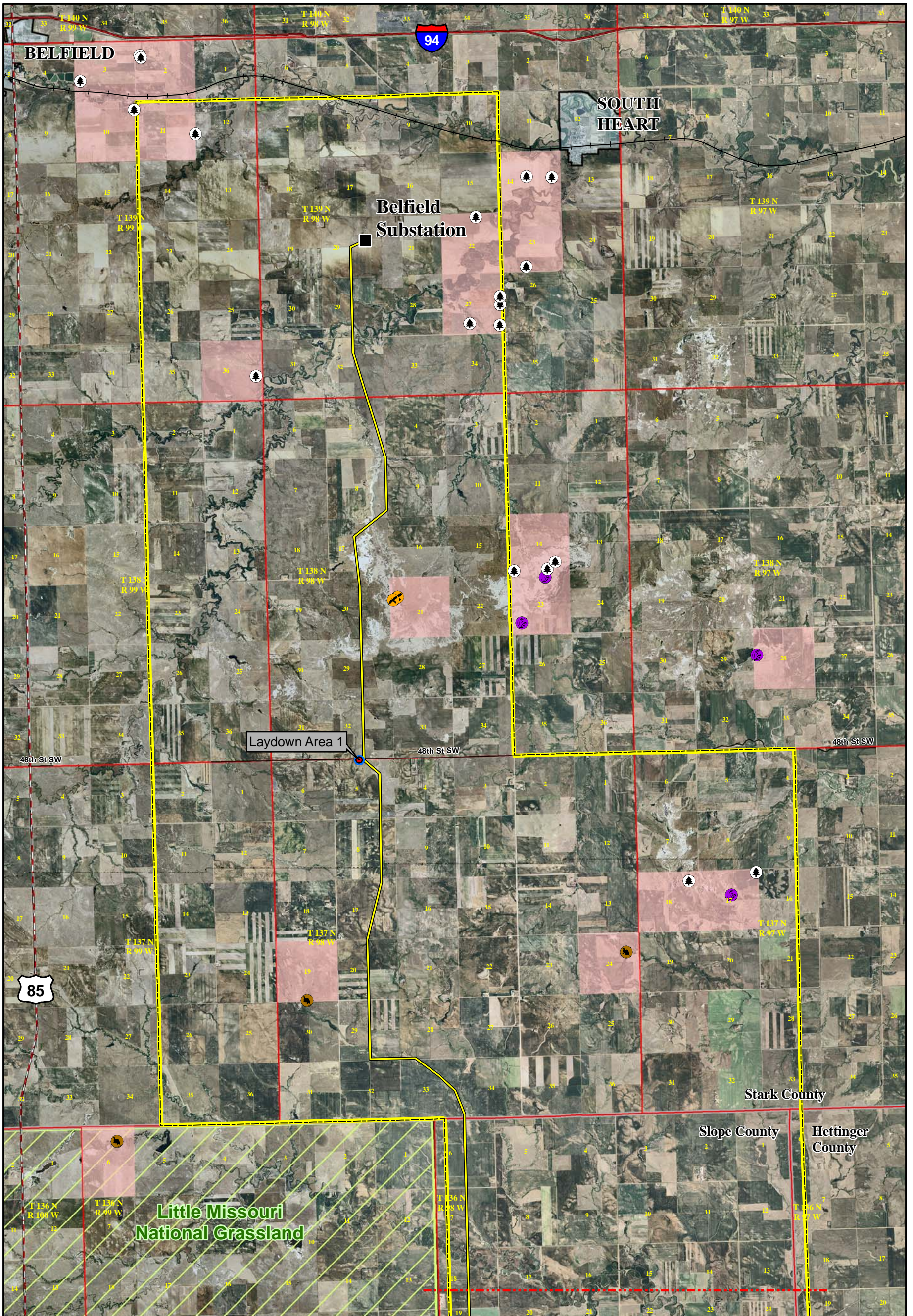
Belfield to Rhame Transmission Project

**Exhibit A-1 Belfield - Rhame
Proposed Route**



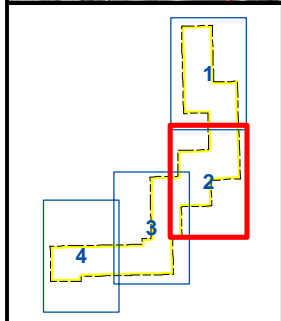
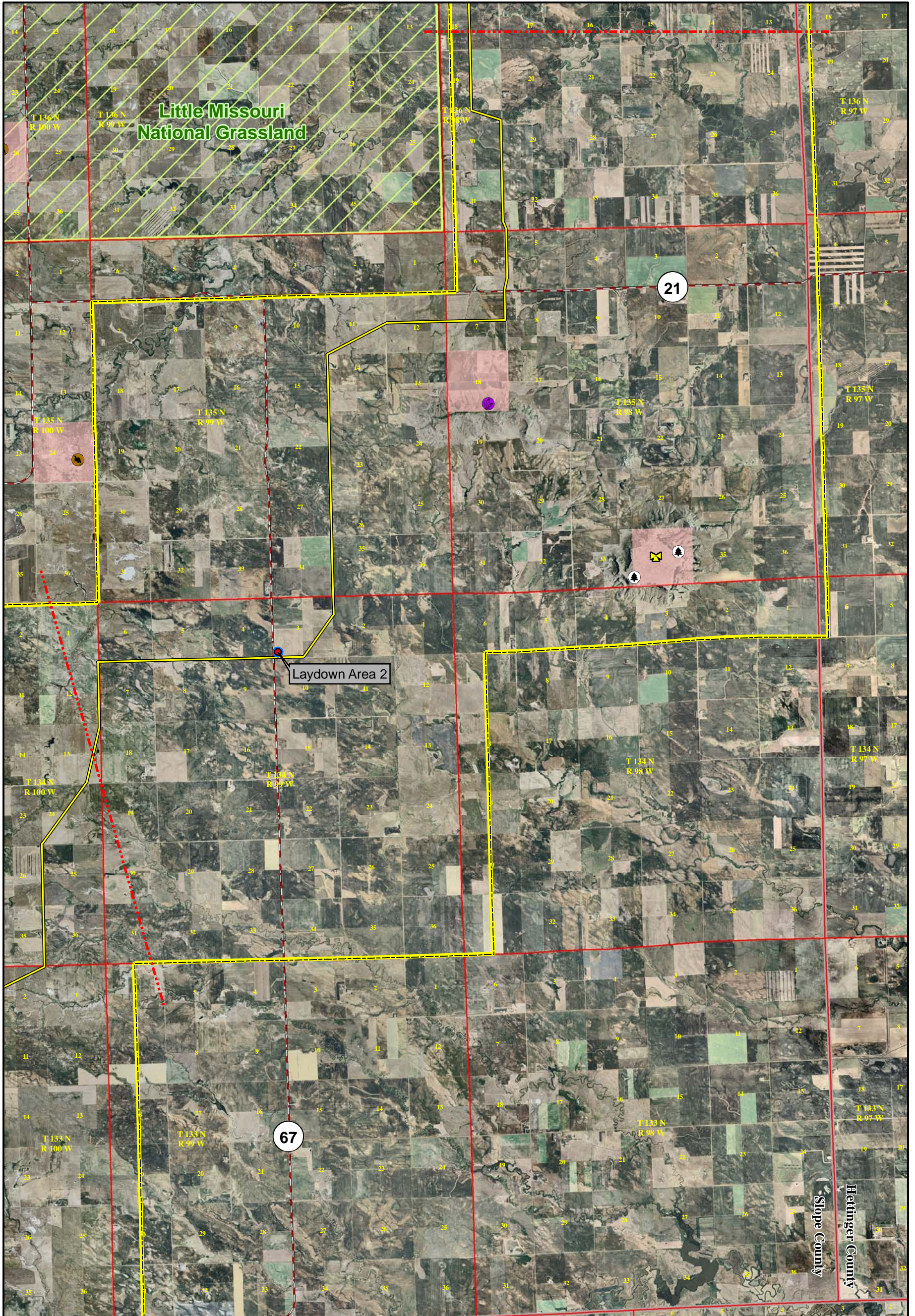
230 KV SINGLE STEEL POLE



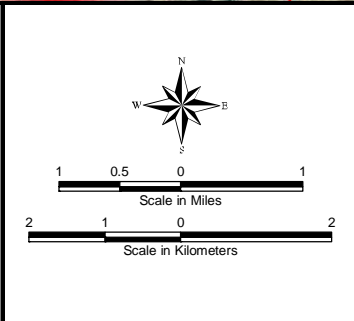


	<p>LEGEND</p> <ul style="list-style-type: none"> Proposed Route Proposed Microwave Tower Proposed Corridor Substation Match Line Township City/Town Exclusion Features Section With Natural Heritage Species Observations Golden Eagle Nest Rare Animal Observation Rare Ecological Community Rare Plant Observation Campground National Grassland 	<p>Scale in Miles Scale in Kilometers</p>	<p>Belfield to Rhame Transmission Project</p> <p>Basin Electric Power Cooperative A Touchstone Energy Cooperative</p> <p>Western Area Power Administration</p> <p>Exhibit B-1 Proposed Route Exclusion Areas</p> <p>ENSR AECOM March 2008</p>
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Sources: Wildlife/Ecology - NDNHI 2007.



LEGEND	
	Proposed Route
	Proposed Microwave Tower
	Proposed Corridor
	Substation
	Match Line
	Township
	City/Town
Exclusion Features	
	Section With Natural Heritage Species Observations
	Golden Eagle Nest
	Rare Animal Observation
	Rare Ecological Community
	Rare Plant Observation
	Campground
	National Grassland

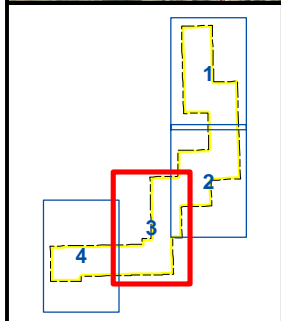
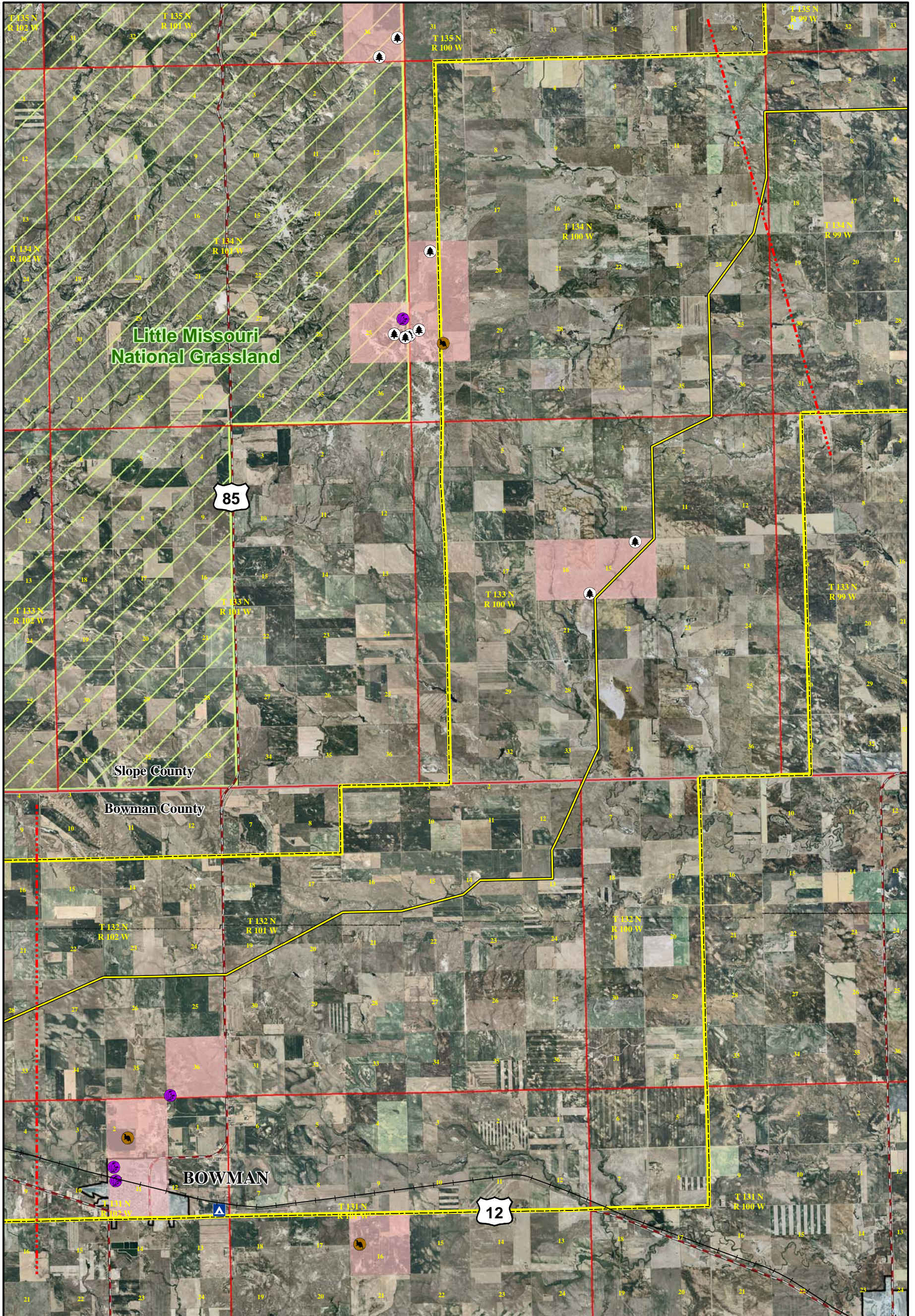


Belfield to Rhame Transmission Project

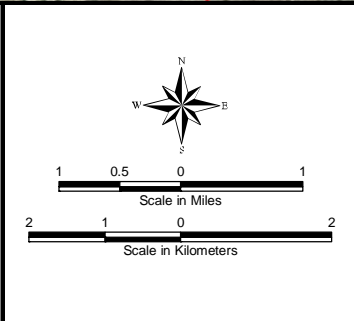
**Exhibit B-2
Proposed Route
Exclusion Areas**

ENSR | AECOM | March 2008

Sources: Wildlife/Ecology - NDNHI 2007.



LEGEND	
	Proposed Route
	Proposed Microwave Tower
	Proposed Corridor
	Substation
	Match Line
	Township
	City/Town
Exclusion Features	
	Golden Eagle Nest
	Rare Animal Observation
	Rare Ecological Community
	Rare Plant Observation
	Campground
	National Grassland
	Section With Natural Heritage Species Observations

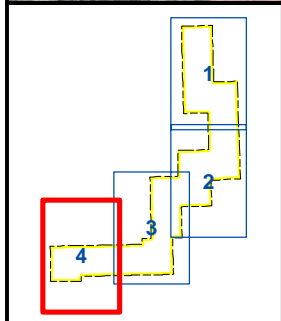
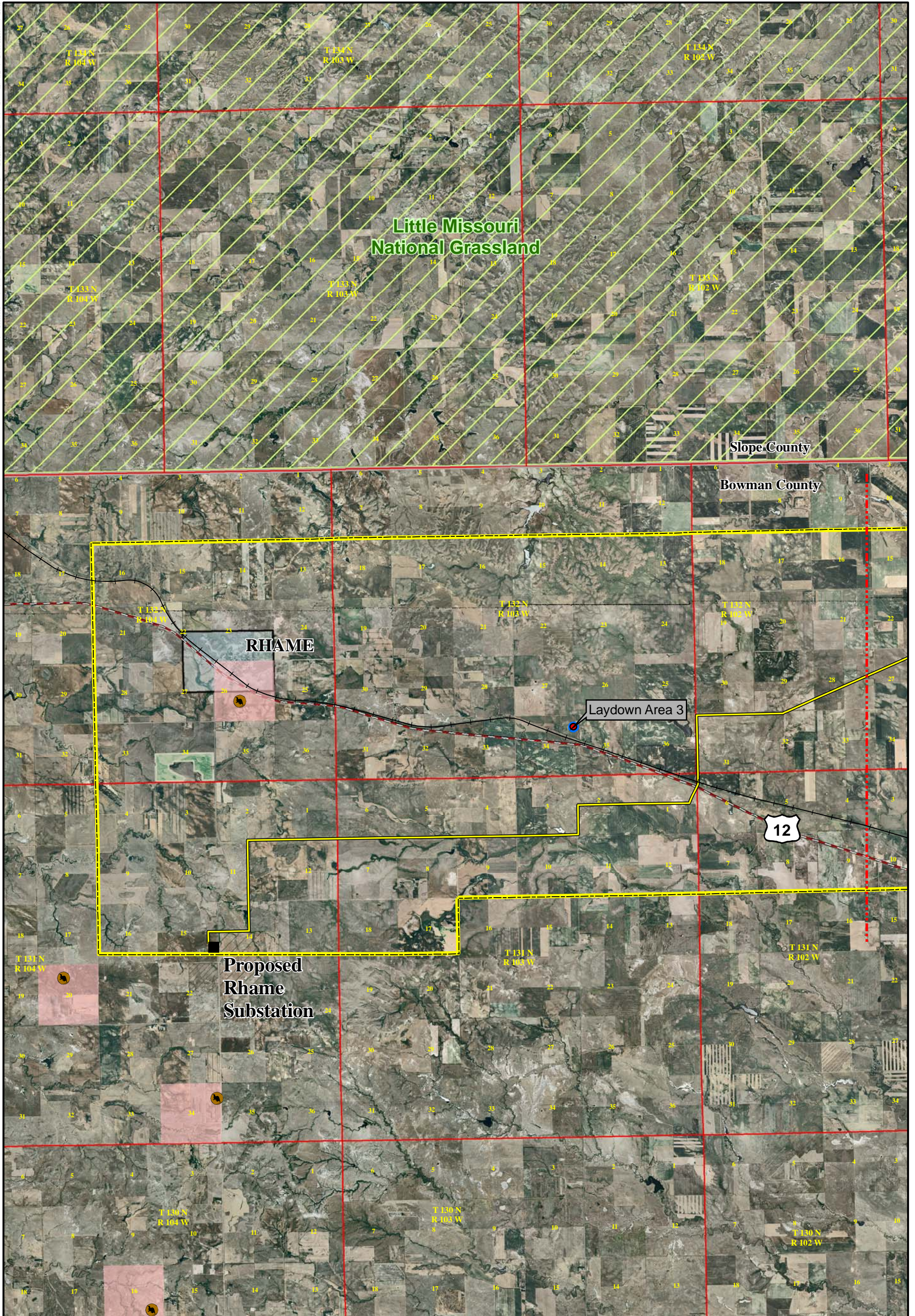


Belfield to Rhame Transmission Project

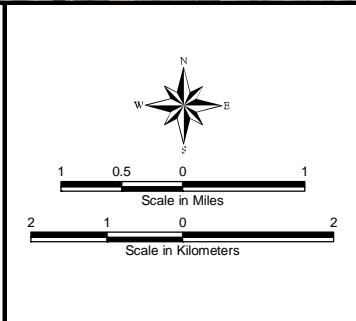
**Exhibit B-3
Proposed Route
Exclusion Areas**

ENSR | AECOM | March 2008

Sources: Wildlife/Ecology - NDNHI 2007.



LEGEND	
	Proposed Route
	Proposed Microwave Tower
	Proposed Corridor
	Substation
	Match Line
	Township
	City/Town
	Section With Natural Heritage Species Observations
	Golden Eagle Nest
	Rare Animal Observation
	Rare Ecological Community
	Rare Plant Observation
	Campground
	National Grassland

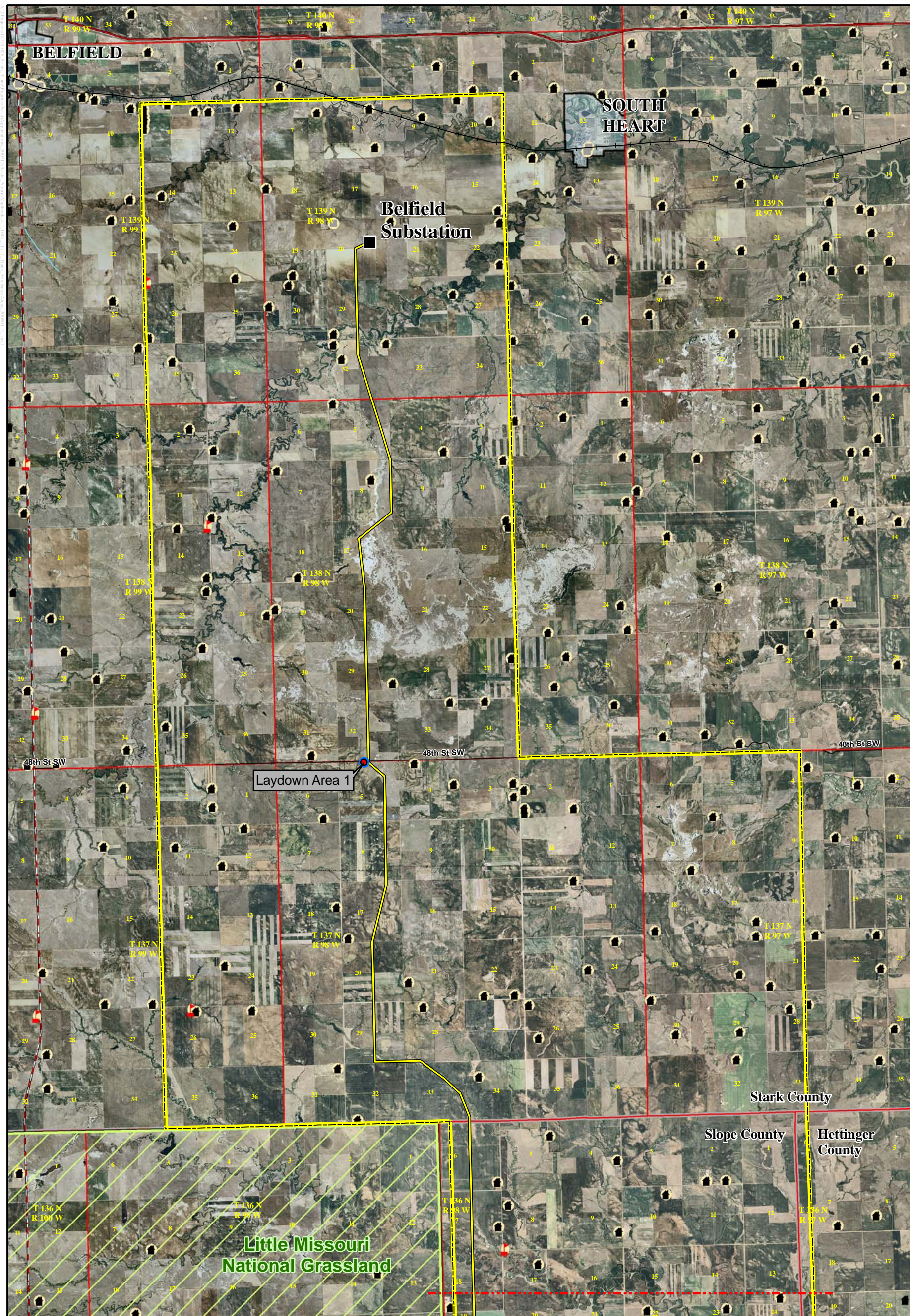


Belfield to Rhame Transmission Project

**Exhibit B-4
Proposed Route
Exclusion Areas**

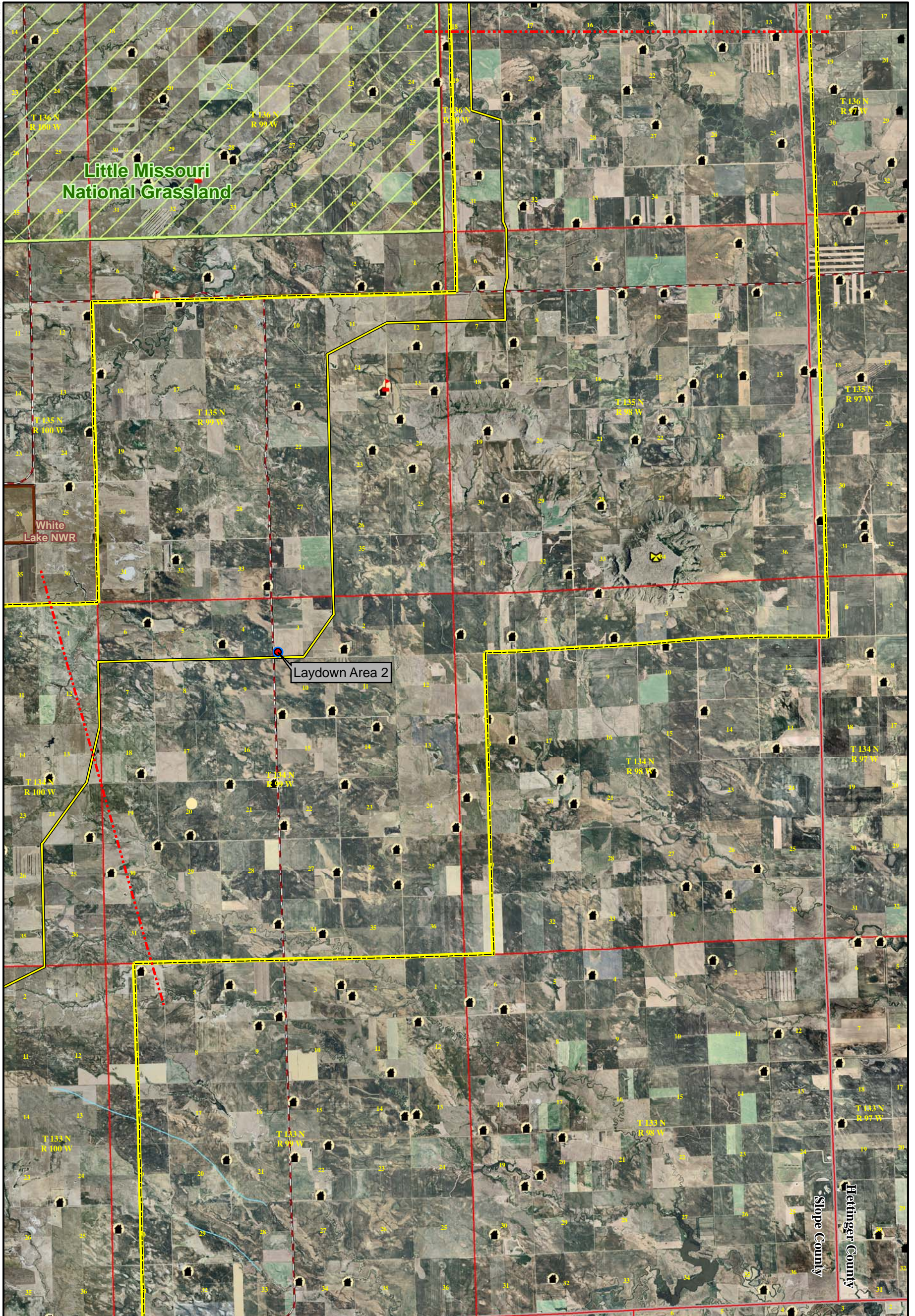
ENSR | AECOM | March 2008

Sources: Wildlife/Ecology - NDNHI 2007.



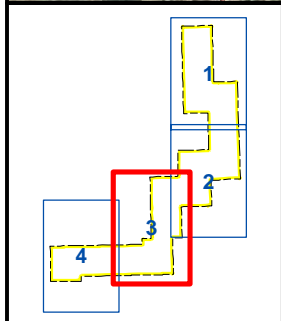
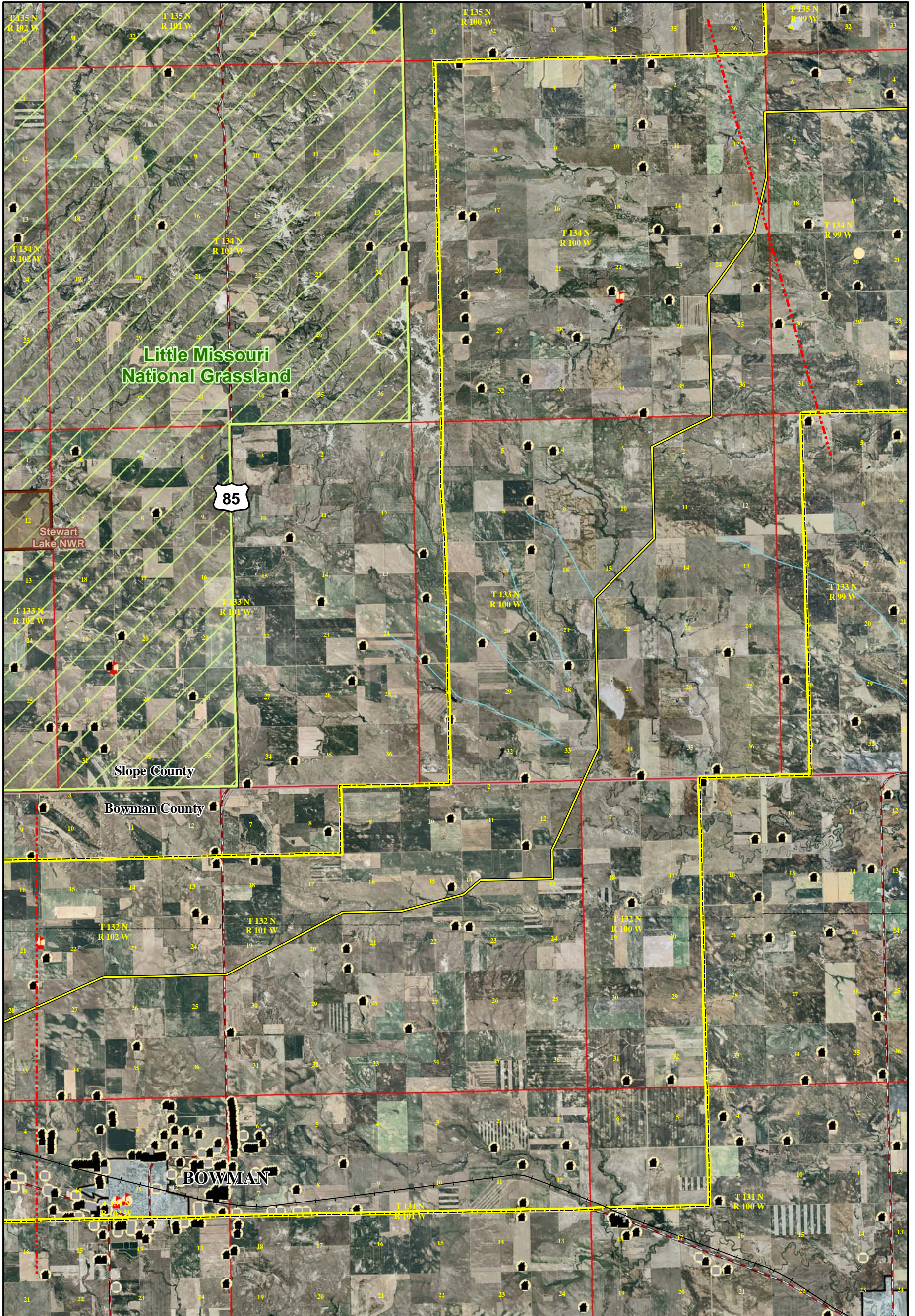
	<p>LEGEND</p> <ul style="list-style-type: none"> — Proposed Route Proposed Microwave Tower Proposed Corridor Substation Match Line Township City/Town <ul style="list-style-type: none"> Avoidance Features U.S. Fish and Wildlife Service National Wildlife Refuge National Grassland School With 500 ft. Buffer Residence or Other Structure With 500 ft. Buffer Place of Business With 500 ft. Buffer Fault Line 	<p>Scale in Miles: 1 0.5 0 1</p> <p>Scale in Kilometers: 2 1 0 2</p>	<p>Belfield to Rhame Transmission Project</p> <p> Basin Electric Power Cooperative Western Area Power Administration</p> <p>Exhibit B-5 Proposed Route Avoidance Areas</p> <p>ENSR AECOM March 2008</p>
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Sources: Schools - USGS, GNIS; Residences/Places of Business - NDDOT 2007; Geology - Clayton, 1980

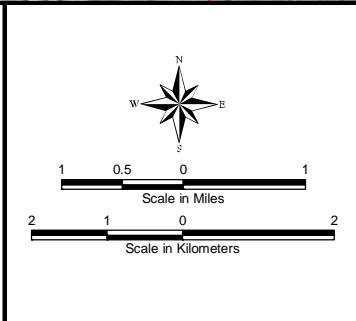


	<p>LEGEND</p> <ul style="list-style-type: none"> — Proposed Route Proposed Corridor Substation Match Line Township City/Town U.S. Fish and Wildlife Service National Wildlife Refuge National Grassland School With 500 ft. Buffer Residence or Other Structure With 500 ft. Buffer Place of Business With 500 ft. Buffer Fault Line 	<p>Scale in Miles: 1 0.5 0 1</p> <p>Scale in Kilometers: 2 1 0 2</p>	<p>Belfield to Rhame Transmission Project</p> <p> </p> <p>Exhibit B-6 Proposed Route Avoidance Areas</p> <p>ENSR AECOM March 2008</p>
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Sources: Schools - USGS, GNIS; Residences/Places of Business - NDDOT 2007; Geology - Clayton, 1980



LEGEND	
	Proposed Route
	Proposed Microwave Tower
	Proposed Corridor
	Substation
	Match Line
	Township
	City/Town
	Avoidance Features U.S. Fish and Wildlife Service National Wildlife Refuge
	National Grassland
	School With 500 ft. Buffer
	Residence or Other Structure With 500 ft. Buffer
	Place of Business With 500 ft. Buffer
	Fault Line

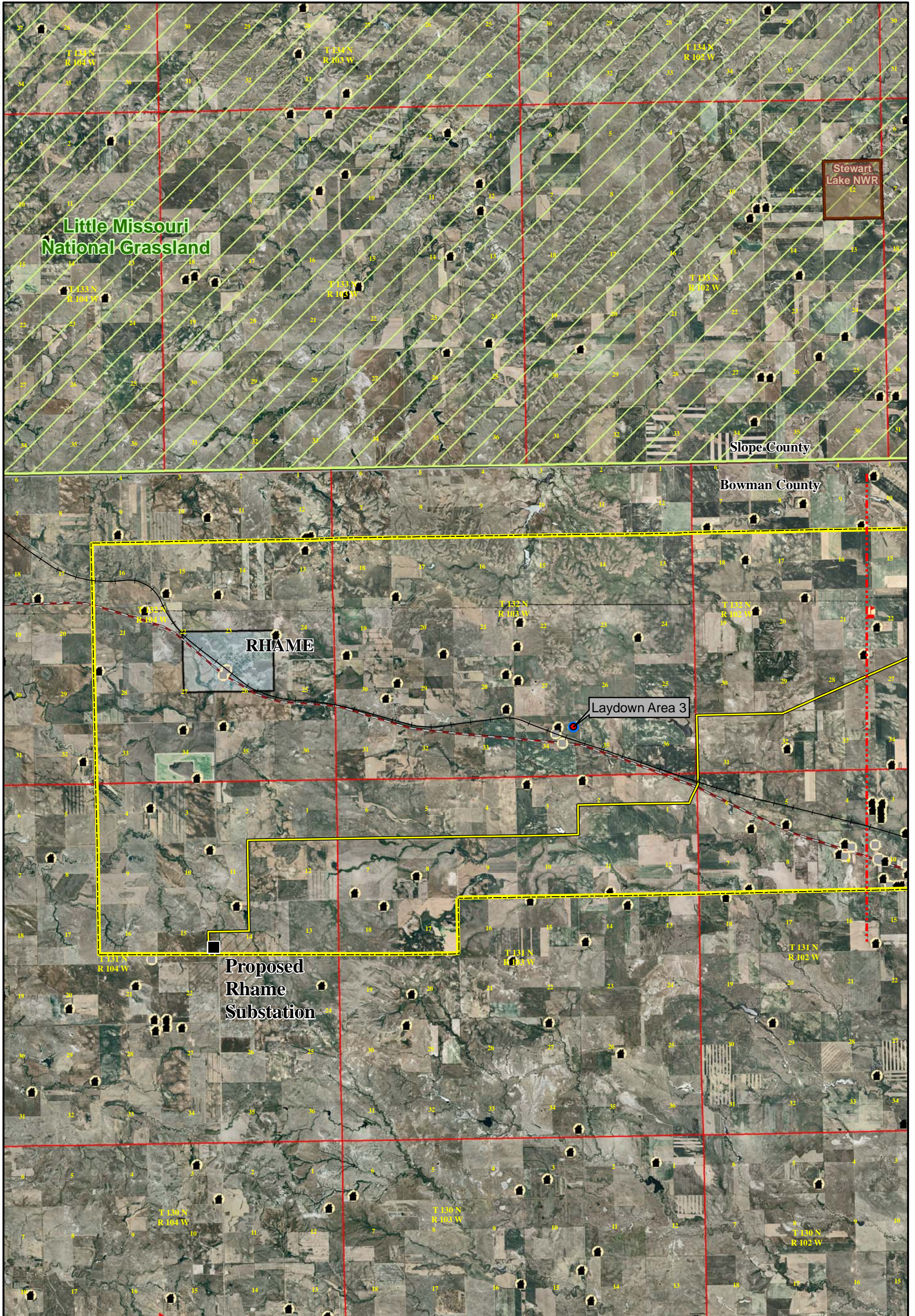


Belfield to Rhame Transmission Project

**Exhibit B-7
Proposed Route
Avoidance Areas**

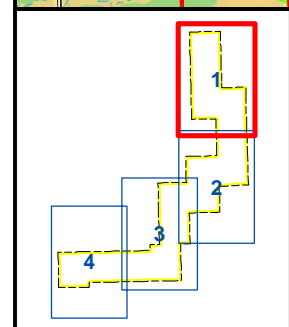
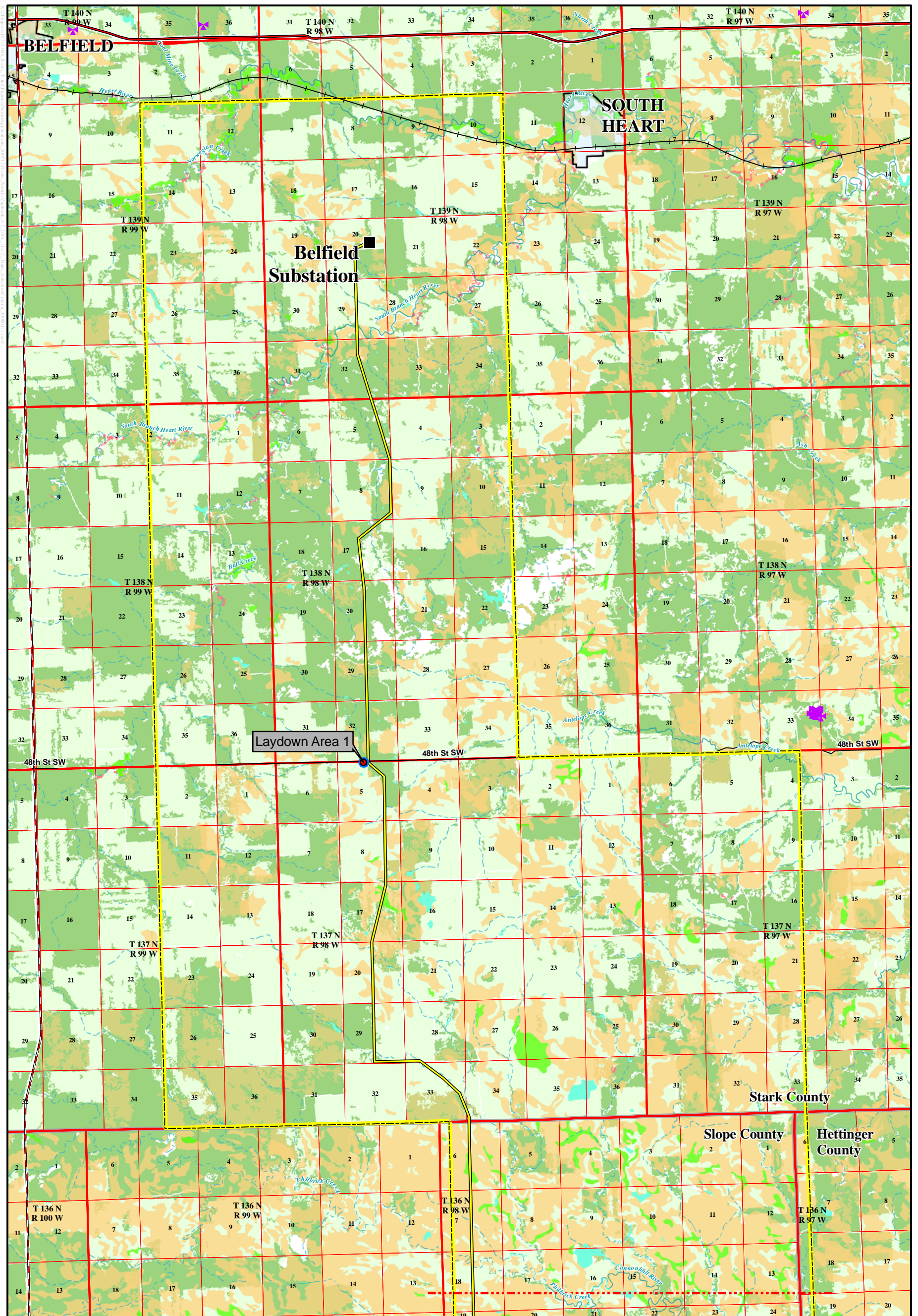
ENSR | AECOM | March 2008

Sources: Schools - USGS, GNIS; Residences/Places of Business - NDDOT 2007; Geology - Clayton, 1980

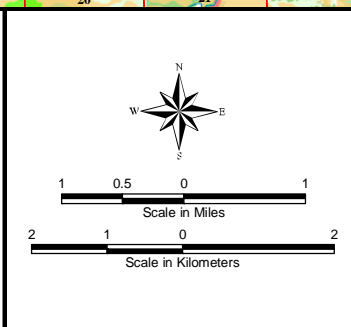


	<p>LEGEND</p> <ul style="list-style-type: none"> — Proposed Route Proposed Microwave Tower Proposed Corridor Substation Match Line Township City/Town U.S. Fish and Wildlife Service National Wildlife Refuge National Grassland School With 500 ft. Buffer Residence or Other Structure With 500 ft. Buffer Place of Business With 500 ft. Buffer — Fault Line 	<p>Scale in Miles: 1 0.5 0 1</p> <p>Scale in Kilometers: 2 1 0 2</p>	<p>Belfield to Rhame Transmission Project</p> <p> </p> <p>Exhibit B-8 Proposed Route Avoidance Areas</p> <p>ENSR AECOM March 2008</p>
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Sources: Schools - USGS, GNIS; Residences/Places of Business - NDDOT 2007; Geology - Clayton, 1980



LEGEND	
	Proposed Transmission Line
	Proposed Microwave Tower
	Proposed Corridor
	Substation
	Match Line
	Township
	City/Town
	Prime Farmland
	Farmland of Statewide Importance
	Cultivated Crops
	Forested
	Grassland
	Pasture/Hay
	Intermittent Stream
	Perennial Stream
	Pond, Lake, or Wetland
	Radio, TV, or Communication Structure

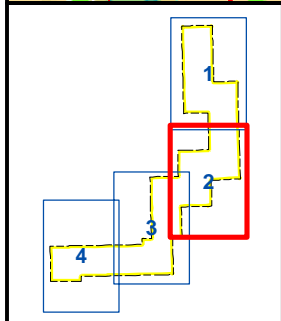
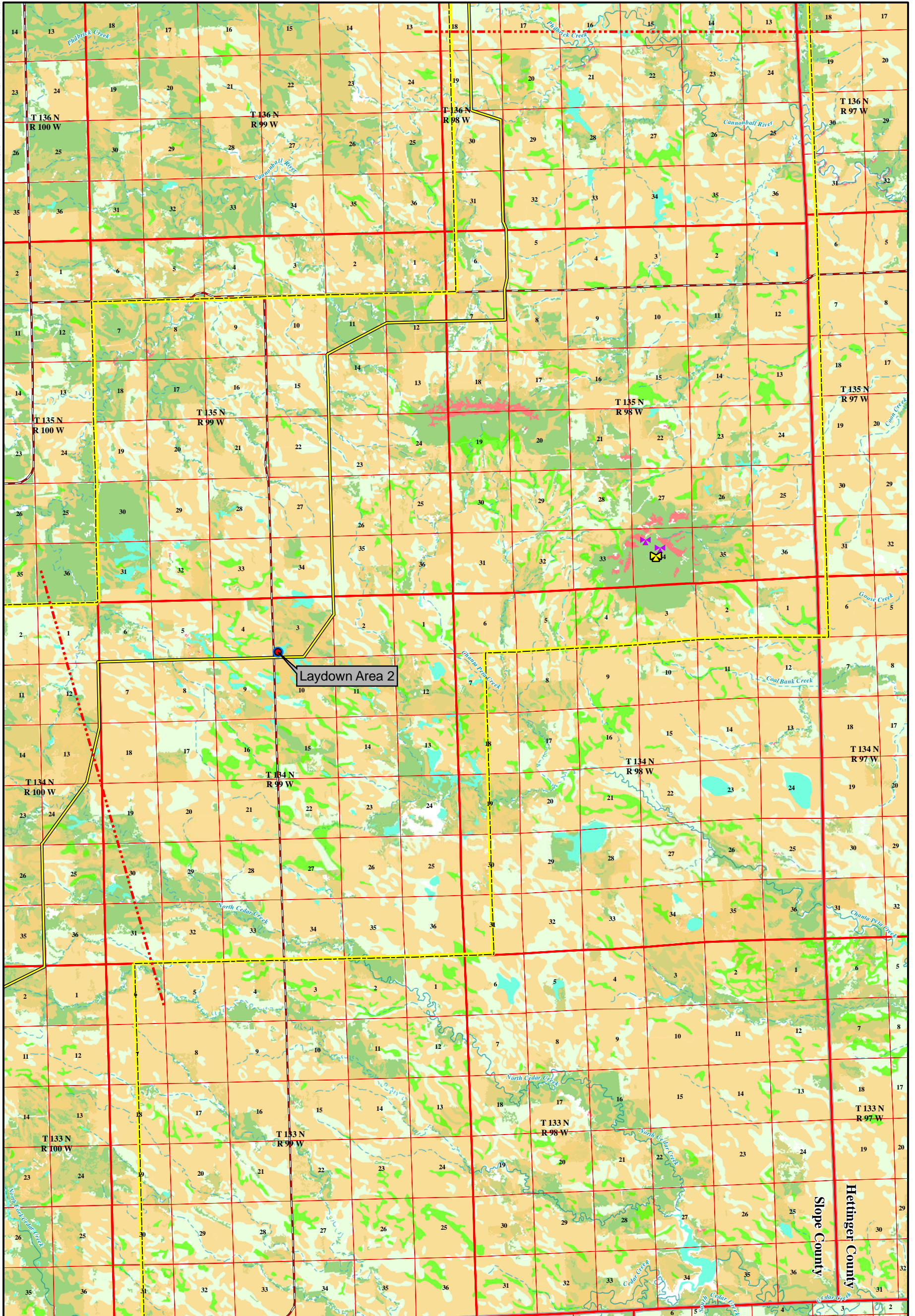


Belfield to Rhome Transmission Project

Exhibit B-9
Proposed Route
Selection Criteria

ENSR | AECOM | March 2008

Sources: Landcover - NLCD 2001; Farmland Types - SSURGO; Wetlands/Waterbodies - NWI, NHD.



LEGEND

Proposed Transmission Line	Selection Criteria
Proposed Microwave Tower	Cultivated Crops
Proposed Corridor	Forested
Substation	Grassland
Match Line	Pasture/Hay
Township	Intermittent Stream
City/Town	Perennial Stream
Prime Farmland	Pond, Lake, or Wetland
Farmland of Statewide Importance	Radio, TV, or Communication Structure

Scale in Miles: 1 0.5 0 1

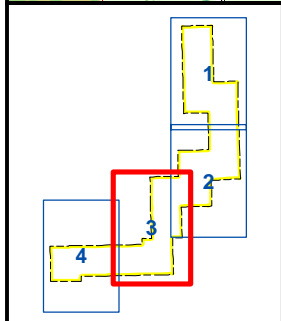
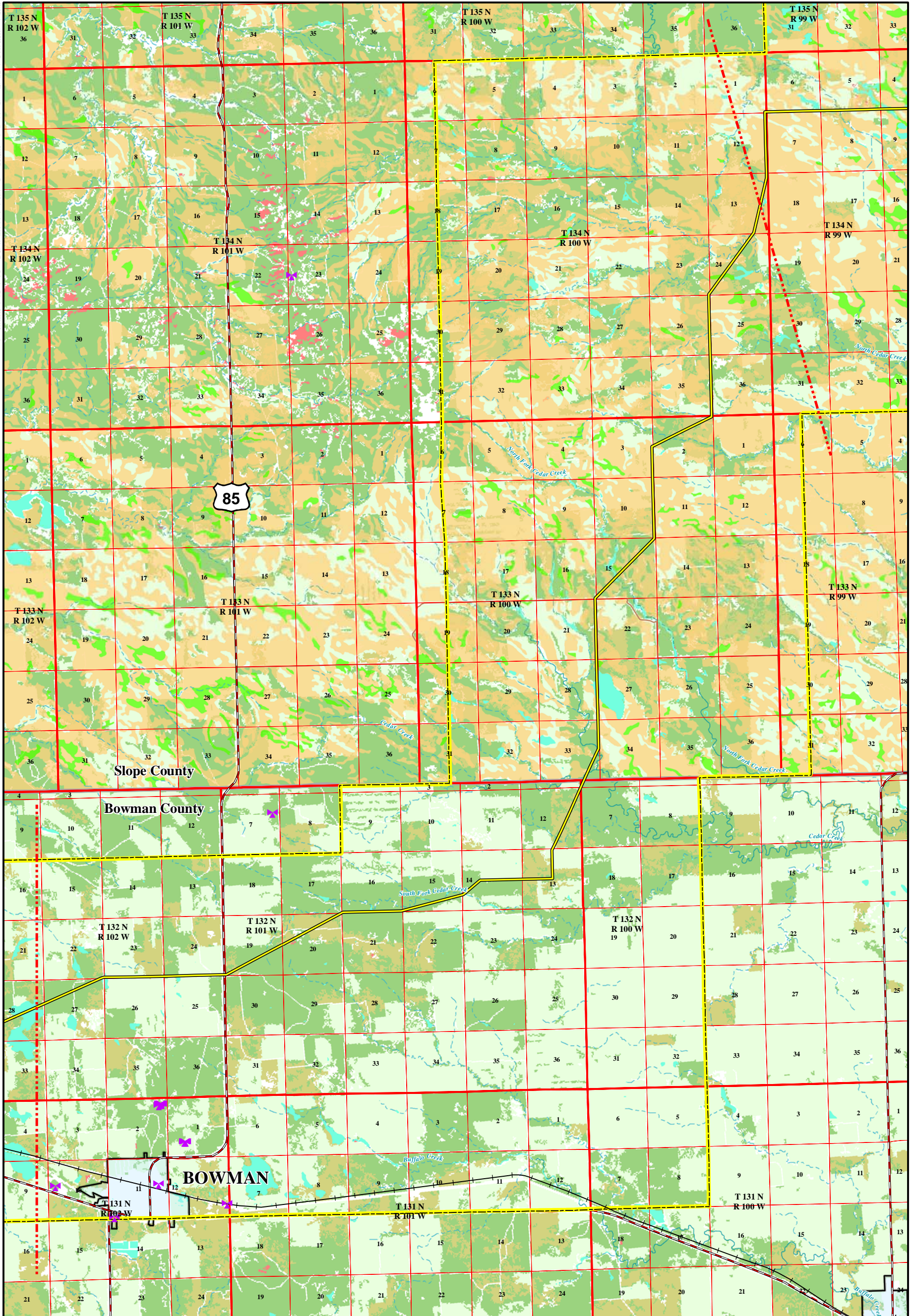
Scale in Kilometers: 2 1 0 2

Belfield to Rhome Transmission Project

Exhibit B-10
Proposed Route
Selection Criteria

ENSR | AECOM | March 2008

Sources: Landcover - NLCD 2001; Farmland Types - SSURGO; Wetlands/Waterbodies - NWI, NHD.



LEGEND

Proposed Transmission Line	Cultivated Crops
Proposed Microwave Tower	Forested
Proposed Corridor	Grassland
Substation	Pasture/Hay
Match Line	Intermittent Stream
Township	Perennial Stream
City/Town	Pond, Lake, or Wetland
Prime Farmland	Radio, TV, or Communication Structure
Farmland of Statewide Importance	

Scale in Miles
1 0.5 0 1

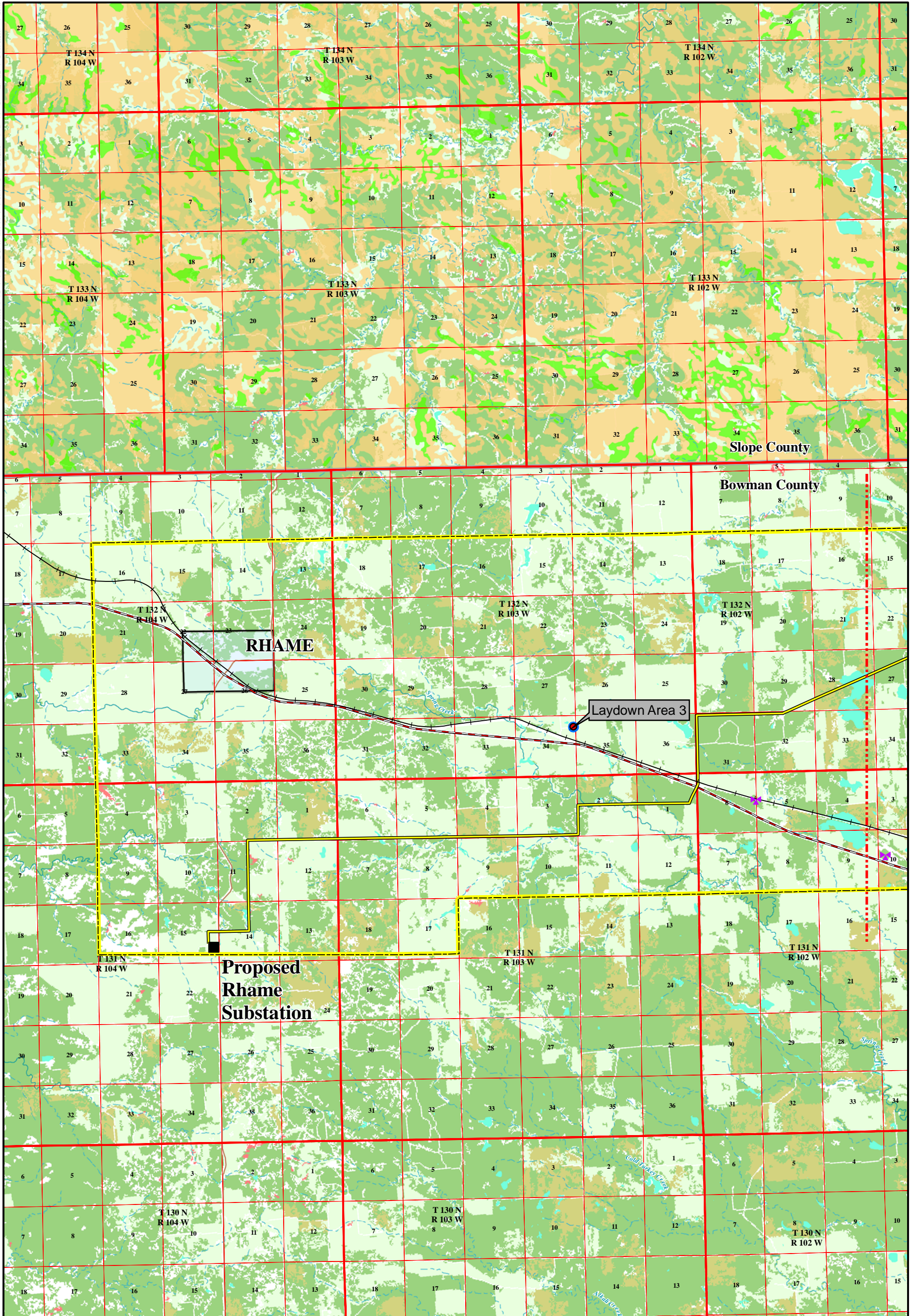
Scale in Kilometers
2 1 0 2

Belfield to Rhome Transmission Project

**Exhibit B-11
Proposed Route
Selection Criteria**

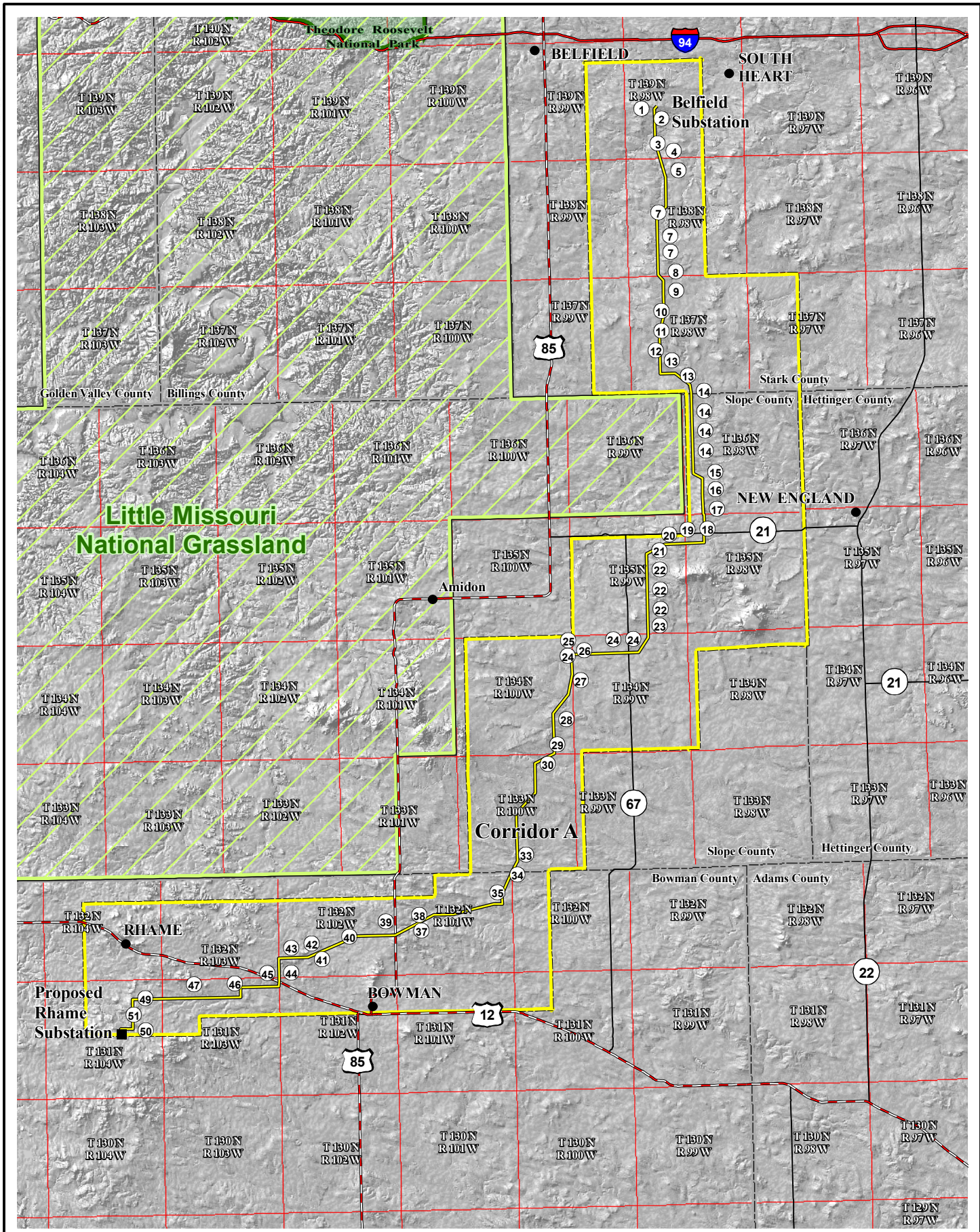
March 2008

Sources: Landcover - NLCD 2001; Farmland Types - SSURGO; Wetlands/Waterbodies - NWI, NHD.



	<p>LEGEND</p> <table border="0"> <tr> <td></td> <td>Proposed Transmission Line</td> <td></td> <td>Cultivated Crops</td> </tr> <tr> <td></td> <td>Proposed Microwave Tower</td> <td></td> <td>Forested</td> </tr> <tr> <td></td> <td>Proposed Corridor</td> <td></td> <td>Grassland</td> </tr> <tr> <td></td> <td>Substation</td> <td></td> <td>Pasture/Hay</td> </tr> <tr> <td></td> <td>Match Line</td> <td></td> <td>Intermittent Stream</td> </tr> <tr> <td></td> <td>Township</td> <td></td> <td>Perennial Stream</td> </tr> <tr> <td></td> <td>City/Town</td> <td></td> <td>Pond, Lake, or Wetland</td> </tr> <tr> <td></td> <td>Prime Farmland</td> <td></td> <td>Radio, TV, or Communication Structure</td> </tr> <tr> <td></td> <td>Farmland of Statewide Importance</td> <td></td> <td></td> </tr> </table>			Proposed Transmission Line		Cultivated Crops		Proposed Microwave Tower		Forested		Proposed Corridor		Grassland		Substation		Pasture/Hay		Match Line		Intermittent Stream		Township		Perennial Stream		City/Town		Pond, Lake, or Wetland		Prime Farmland		Radio, TV, or Communication Structure		Farmland of Statewide Importance			<p>Scale in Miles: 0, 0.5, 1</p> <p>Scale in Kilometers: 0, 1, 2</p>	<p>Belfield to Rhame Transmission Project</p> <p>Exhibit B-12 Proposed Route Selection Criteria</p>
		Proposed Transmission Line		Cultivated Crops																																				
	Proposed Microwave Tower		Forested																																					
	Proposed Corridor		Grassland																																					
	Substation		Pasture/Hay																																					
	Match Line		Intermittent Stream																																					
	Township		Perennial Stream																																					
	City/Town		Pond, Lake, or Wetland																																					
	Prime Farmland		Radio, TV, or Communication Structure																																					
	Farmland of Statewide Importance																																							
<p>ENSR AECOM</p>		<p>March 2008</p>																																						

Sources: Landcover - NLCD 2001; Farmland Types - SSURGO; Wetlands/Waterbodies - NWI, NHD.



- LEGEND**
- Proposed Route
 - Proposed Corridor
 - Substation
 - City or Town
 - National Grassland
 - National Park
 - Township



Belfield to Rhame Transmission Project
 BASIN ELECTRIC POWER COOPERATIVE
 A Touchstone Energy Cooperative
 Western AREA POWER ADMINISTRATION

Exhibit D-1
Refined Routing Locations

Appendix A

Special Status Species

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
MAMMALS								
Black-footed ferret	<i>Mustela nigripes</i>	FE; ND Level I	Suitable habitat consists of prairie dog colonies or complexes (10,000 acres or greater) with towns no further than three miles apart to sustain a viable population of 120 ferrets. The black-footed ferret is presumed extirpated from North Dakota.	Prairie dog colonies	Yes	No	Bowman Slope Stark	USFWS Webpage – Region 6; Hagen et al. 2005; USFWS 2007a
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	ND Level I	This species inhabits prairie communities with short vegetation and flat topography. Often found in relation to areas grazed by livestock and live in large colonies known as “towns”.	Shortgrass prairie/grazed areas	Yes	No	Bowman Slope Stark	Hagen et al. 2005; NatureServe 2007
Gray wolf	<i>Canis lupis</i>	FE; ND Level III	This species inhabits a wide range of habitats where large ungulates are found. Use mixed hardwood-coniferous forests in wilderness and sparsely settled areas, to forest and prairie landscapes dominated by agricultural and pasture lands.	Any	Yes	No	Bowman Slope Stark	Hagen et al. 2005; USFWS 2007a
Hispid pocket mouse	<i>Chaetodipus hispidus</i>	ND Level III	This species prefers short and mixed-grass prairie and may also utilize grain fields.	Shortgrass and mixed-grass prairie	Yes	No	Bowman Slope	Hagen et al. 2005
Long-eared myotis	<i>Myotis evotis</i>	ND Level III	This species typically roosts in rugged terrain in small groups or alone in rock crevices and under tree bark. They are also associated with coniferous trees. This species hibernates in caves and abandoned mines.	Rugged terrain and coniferous trees	Yes	No	Bowman Slope Stark	Hagen et al. 2005; NDGFD 2007b

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Long-legged myotis	<i>Myotis volans</i>	ND Level III	This species typically roosts in rugged terrain in small groups or alone in rock crevices and under tree bark. They are also associated with coniferous trees.	Rugged terrain and coniferous trees	Yes	No	Bowman Slope	Hagen et al. 2005; NDGFD 2007b
River otter	<i>Lontra canadensis</i>	ND Level II	This species prefers aquatic habitats with year-round water supplies. They utilize wetland/riparian areas with a constant food supply and adequate cover. Also associated with beaver activity.	Riparian	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Sagebrush vole	<i>Lemmyscus curtatus</i>	ND Level III	This species prefers semi-arid areas with loose soil; usually a combination of grass and sagebrush.	Semi-arid lands	Yes	No	Bowman Slope Stark	Hagen et al. 2005; NDGFD 2007b
Swift fox	<i>Vulpes velox</i>	ND Level II	This species is found in short-, mid-, and mixed-grass prairies with gently rolling hills. Den sites are typically located on flat areas or along slopes or ridges that provide a good view. Dens are typically on sites dominated by blue grama or buffalograss. Young are born in late March, April, or early May. The swift fox is presumed extirpated in North Dakota.	Grasslands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Western small-footed myotis	<i>Myotis ciliolabrum</i>	ND Level III	This species typically roosts in rugged terrain in small groups or alone in rock crevices and under tree bark. They are only found in North Dakota's badlands and are also associated with coniferous trees.	Rugged terrain and coniferous trees	Yes	No	Stark	Hagen et al. 2005; NDGFD 2007b

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
BIRDS								
American advocet	<i>Recurvirostra americana</i>	ND Level II	This species prefers ponds or lakes with exposed, sparsely vegetated shorelines. Peak breeding season: mid-May to early July.	Ponds or lakes	Yes	No	Bowman Slope Stark	Hagen et al. 2005
American bittern	<i>Botaurus lentiginosus</i>	ND Level I	This species inhabits a variety of wetlands, particularly large wetlands with tall emergent vegetation. This migratory bird will also nest in tall, dense grassland. Peak breeding season: mid-June to late July.	Wetlands and tall, dense grasslands	Yes	No	Secondary range: Bowman Slope Stark	Hagen et al. 2005
Baird's sparrow	<i>Ammodramus bairdii</i>	ND Level I	This species prefers extensive tracts of native prairie but will utilize idle, tame grasslands, and lightly to moderately grazed pastures. Stands of grasses with narrow leaves are readily used. Peak breeding season: early June to late July.	Extensive tracts of native mixed-grass prairie and lightly grazed pastures	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Bald eagle	<i>Haliaeetus leucocephalus</i>	ND Level II	This species typically occurs near large bodies of water that support suitable roosting and foraging habitat. Nest sites typically occur in proximity to open water and generally are found in mature heterogeneous stands of multi-storied trees, but also may nest on cliffs. Winter habitat typically includes areas of open water, adequate food sources, and sufficient diurnal perches and night roosts. Breeding season: January through July. Winter season: November 15 through March 15.	Large rivers and waterbodies	Yes	No	Bowman Slope Stark	Hagen et al. 2005; USFWS 2007a

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Bobolink	<i>Dolichonyx oryzivorus</i>	ND Level II	This species uses a variety of grasslands but prefers moderate to tallgrass prairie, hayland, and retired croplands. Peak breeding season: early June to mid-July.	Grasslands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	ND Level I	This species inhabits bushy margins or openings of woodlands, and thickets of small trees or shrubs on the prairie. Also uses riparian areas, shelterbelts and wooded areas of towns and farmsteads. Peak breeding season: mid-June to late July.	Wooded areas	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Brewer's sparrow	<i>Spizella breweri</i>	ND Level II	This species inhabits shrubland communities dominated by sagebrush and juniper woodlands. This species is present in North Dakota from May to mid-September. Peak breeding season: mid-May to late July.	Sagebrush communities	Yes	No	Bowman Slope	Hagen et al. 2005; NDNHI 2007; NDGFD 2007b
Burrowing owl	<i>Athene cunicularia</i>	ND Level II	This migratory species inhabits open grasslands with short vegetation and bare ground. Rely exclusively on burrowing mammals to create burrows for nest sites. Peak breeding season: early May to mid-August.	Prairie dog colonies	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Chestnut-collared longspur	<i>Calcarius ornatus</i>	ND Level I	This species is described as a native prairie specialist. Level to rolling, open, arid, mixed-grass and shortgrass prairie is utilized. Peak breeding season: early May to mid-July.	Native prairie	Yes	No	Bowman Slope Stark	Hagen et al. 2005

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Canvasback	<i>Aythya valisineria</i>	ND Level II	This species prefers deep wetlands, particularly semipermanent wetlands with emergent cover. Peak breeding season: mid-May to mid-August.	Open water	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Dickcissel	<i>Spiza americana</i>	ND Level II	This species uses a variety of grassland habitats but prefers areas with alfalfa, sweet clover, and other brushy grasslands. Peak breeding season: early June to mid-August.	Grasslands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Ferruginous hawk	<i>Buteo regalis</i>	ND Level I	This species inhabits a variety of open country and shrubland. Usually avoids cultivated fields, heavily grazed pastures, high elevations, and forest interiors. May be associated with prairie dog towns. Peak breeding season: late April to mid-July.	Open country and shrublands	Yes	No	Bowman Slope Stark	Hagen et al. 2005; Gomes (No Date)
Golden eagle	<i>Aquila chrysaetos</i>	ND Level II	This species inhabits rugged portions of badlands and buttes overlooking open shrubland and grasslands. Typically nests on south facing cliffs and may be associated with prairie dog towns. Peak breeding season: late April to late June.	Cliffs	Yes	No	Bowman Slope Stark	Hagen et al. 2005; Gomes (No Date)
Grasshopper sparrow	<i>Ammodramus savannarum</i>	ND Level I	This species inhabits grasslands of intermediate height, clumped vegetation, patches of bare ground, moderate litter depth, and sparse woody vegetation. Also uses native and tame grasslands, CRP, haylands, and croplands. Peak breeding season: early June to late July.	Open country	Yes	No	Bowman Slope Stark	Hagen et al. 2005

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Greater sage grouse	<i>Centrocercus urophasianus</i>	ND Level II	This species uses a wide variety of sagebrush mosaic habitats, including tall, low and a mixture of sagebrush types. Riparian and upland meadows, irrigated and non-irrigated croplands and pasturelands are also used. Peak breeding season: early May to mid July.	Sagebrush habitats	Yes	No	Bowman Slope	NDGFD Webpage – GSG Conservation plan; NDGFD 2007a
Lark bunting	<i>Calamospiza melanocorys</i>	ND Level I	This species inhabits mixed-grass prairies and sagebrush communities. Weedy cropland, CRP, hayland, and pastures are also used. Peak breeding season: early June to early August.	Open country and shrubland	Yes	No	Bowman Slope Stark	Hagen et al. 2005
LeConte's sparrow	<i>Ammodramus leconteii</i>	ND Level II	This species prefers fens, wet meadows, and marshes of sedge grasses. Peak breeding season: late May to mid-August.	Wetlands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Loggerhead shrike	<i>Lanius ludovicianus</i>	ND Level II	This species prefers open country with thickets of small trees, shrubs, and shelterbelts. Peak breeding season: early May to mid-June.	Open country with tree clumps	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Long-billed curlew	<i>Numenius americanus</i>	ND Level I	This species uses expansive, open, level to gently rolling or sloping grasslands of short vegetation such as short-grass and grazed mixed-grass prairie for breeding. Proximity to water is an important factor in habitat selection. Nests in dry uplands next to wet meadows. Peak breeding season: early May to early July.	Open grasslands adjacent to water	Yes	No	Bowman Slope Stark	Hagen et al. 2005

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Marbled godwit	<i>Limosa fedoa</i>	ND Level I	This species requires large expanses of short, sparse to moderately vegetated uplands for nesting and a variety of wetlands for foraging. Requires a high percentage of grass cover and wetlands. Peak breeding season: early May to late June.	Prairie adjacent to wetlands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
McCown's longspur	<i>Calcarius mccownii</i>	ND Level III	This species prefers arid, shortgrass prairie or heavily grazed mixed-grass prairie. Peak breeding season: late May to mid-July.	Shortgrass prairie	Yes	No	Bowman Slope	Hagen et al. 2005
Northern harrier	<i>Circus cyaneus</i>	ND Level II	This species inhabits open grasslands and wetlands with tall, dense vegetation. This migratory bird will utilize native or tame vegetation in wet or dry grasslands, fresh to alkali wetlands, lightly grazed pastures, croplands, shrubby fields and fallow fields. Breeding season: late April to early August.	Grasslands, agricultural fields, and wetlands	Yes	No	Bowman Slope Stark	Hagen et al. 2005; Gomes (No Date)
Northern pintail	<i>Anas acuta</i>	ND Level II	This species prefers wetland complexes of open water and associated upland native prairie. Peak breeding season: early April to early July.	Open water	Yes	No	Bowman Slope Stark	Hagen et al. 2005

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Peregrine falcon	<i>Falco peregrinus</i>	ND Level III	This species uses open expanses of native prairie, badland complexes, rocky cliffs overlooking rivers, lakes, or other water in North Dakota. Nests on high ledges, cliffs, steep sides of buttes, and tall buildings. Only one breeding pair has been identified in Fargo, North Dakota. Peak breeding season: May to July.	Cliffs	Yes	No	Bowman Slope Stark	Hagen et al. 2005; Gomes (No Date)
Prairie falcon	<i>Falco mexicanus</i>	ND Level II	This species inhabits shortgrass prairie, shrubsteppe, and agricultural areas in generally arid landscapes. Nests primarily on cliffs, buttes, canyon walls, rock outcrops, and ridges. May nest in trees and transmission line towers. Peak breeding season: April to July.	Cliffs	Yes	No	Bowman Slope Stark	Hagen et al. 2005; Gomes (No Date)
Redhead	<i>Aythya americana</i>	ND Level II	This species uses a variety of wetland types but prefers semipermanent and deep seasonal wetlands. Peak breeding season: early June to late August.	Open water	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	ND Level II	This species prefers natural stands of mature deciduous trees along river bottoms, shelterbelts, and wooded areas of towns. Peak breeding season: early June to early August.	Deciduous tree stands	Yes	No	Bowman Slope Stark	Hagen et al. 2005

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	ND Level II	This species uses mixed-grass prairie with patches of shrubs and small trees. CRP grasslands are important to this species. Nests in lightly grazed native prairie, haylands, CRP, and may be located close to the margin of a thicket of shrubs or small trees. Peak breeding season mid May to early August.	Mixed-grass prairie with patches of shrubs	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Short-eared owl	<i>Asio flammeus</i>	ND Level II	This species inhabits large expanses of open grassland and wetland areas. Uses native prairie, hayland, retired cropland, small grain stubble, shrubsteppe, and wet meadow zones of wetlands. CRP land is important for this species. Peak breeding season: late April to mid-July.	Open country	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Sprague's pipit	<i>Anthus spragueii</i>	ND Level I	This species requires large native grasslands of intermediate height and sparse to intermediate vegetation density, low forb density, and little bare ground but low litter depth. Peak breeding season: early may to mid-August.	Large native grasslands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Swainson's hawk	<i>Buteo swainsoni</i>	ND Level I	This species inhabits open grasslands with scattered trees or shrubs. Also uses shortgrass, mixed-grass, tallgrass prairie, riparian areas, isolated trees, shelterbeds, pasture, hayland, cropland, and wetland borders. Peak breeding season: April to August.	Open country with scattered trees and shrubs	Yes	No	Bowman Slope Stark	Hagen et al. 2005; Gomes (No Date)

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Upland sandpiper	<i>Bartramia longicauda</i>	ND Level I	This species inhabits native and tame grassland, wet meadows, hayland, pastures, CRP, cropland, highway and railroad rights-of-way. Often uses wooden fence posts for viewing. Peak breeding season: late May to early July.	Open country	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Whooping crane	<i>Grus americana</i>	FE; ND Level III	During migration, this species uses primarily wetlands and cropland ponds for rooting and feeding. Spring and fall migration through the project regions generally occurs from April to mid-May and from mid-September to October.	Wetlands bordered by agricultural fields	Yes	No	Bowman Slope Stark	USFWS Webpage – Region 6; Hagen et al. 2005; USFWS 2007a
Willet	<i>Cataprophorus semipalmatus</i>	ND Level I	Large expanses of short, sparse grasslands, particularly native grasslands, are important for nesting and foraging. Prefer wetlands with shallow water areas with sparse shoreline vegetation. Peak breeding season: late May to mid-July.	Wetlands with sparse shorelines adjacent to native shortgrass prairie.	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Wilson's phalarope	<i>Phalaropus tricolor</i>	ND Level I	This species uses wetlands with open water, emergent vegetation, and open shoreline for foraging and wet meadows, upland grasslands, and wetlands for nesting. Peak breeding season: late May to early June.	Wetlands adjacent to upland grasslands	Yes	No	Secondary range: Bowman Slope Stark	Hagen et al. 2005
Reptiles / Amphibians								
Common snapping turtle	<i>Chelydra serpentina</i>	ND Level II	This species prefers warm water in permanent lakes or rivers with a muddy bottom and plenty of aquatic vegetation.	Lakes or rivers	Yes	No	Bowman Slope Stark	Hagen et al. 2005

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Northern sagebrush lizard	<i>Sceloporus graciosus</i>	ND Level III	This species prefers sagebrush and rocky areas near water.	Sagebrush	Yes	No	Slope	Hagen et al. 2005; NDGFD 2007b
Plains spadefoot	<i>Spea bombifrons</i>	ND Level I	This species inhabits dry, open grasslands with sandy or loose soils. Temporary wetlands without vegetation, such as those found in agricultural fields, are easily flooded and may provide tolerable breeding habitat.	Open grasslands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Short-horned lizard	<i>Phrynosoma douglassi</i>	ND Level II	This species prefers semi-arid, shortgrass prairie in rough terrain.	Arid landscapes	Yes	No	Bowman Slope	Hagen et al. 2005; NDGFD 2007b
Western hognose snake	<i>Heterodon nasicus</i>	ND Level I	This species prefers dry, sandy or gravelly areas in grassland, open sand prairies, or sand dunes. Burrows into loose soil or small mammal burrows for cover.	Open sand prairies	Yes	No	Bowman Slope Stark	Hagen et al. 2005; NDGFD 2007b
Fish								
Blue sucker	<i>Cycleptus elongatus</i>	ND Level I	This species inhabits streams with swift currents and large turbid rivers. Found mostly in riffles or narrow chutes. Requires gravel bottoms free of sediment.	Large, turbid rivers with gravel bottoms free of sediment	No	Yes – No suitable habitat crossed by the ROW	Slope	Hagen et al. 2005

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Flathead chub	<i>Platygobio gracilis</i>	ND Level II	This species occurs in small creeks and the largest rivers that have turbid fluctuating water levels and unstable sand bottoms. This species relies on flood flows to spawn successfully. Spawning occurs after water levels have subsided after peak flows, when water temperatures are warmer and substrate is more stable. Relies on flood flows to spawn successfully. Spawns after rivers have subsided following peak flow.	Turbid rivers with sandy substrate	Yes	No – suitable habitat for this species occurs within the Cannonball and Heart Rivers crossed by the Project.	Bowman Slope Stark	Hagen et al. 2005
Northern redbelly dace	<i>Phoxinus eos</i>	ND Level II	This species occurs in a variety of habitats ranging from streams to bog lakes.	Waterbodies	Yes	No – Suitable habitat for this species is found within the South Fork Heart and Cannonball rivers crossed by the project.	Bowman Slope Stark	NDNHI 2007
Invertebrates								
Pink papershell	<i>Potamilus oheinsis</i>	ND Level III	This species occurs within the tributaries of large river systems. The substrate of the rivers is mud, sand, or gravel	Medium to large rivers	None – September Surveys	Yes – No suitable habitat crossed by the ROW.	Slope Stark	Hagen et al. 2005

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Plants								
Alkali sacaton	<i>Sporobolus airoides</i>	ND SOC	This perennial grows in large bunches 2-3.5 feet tall on dry to moist sites with sand or gravelly soils. Most often found growing on alkaline flats, prairies, and sandy plateaus. Common along drainages in desert and semi-desert areas. Flowers in mid-summer.	Sand prairies	Yes	No	Bowman	NDNHI 2007; USDA, NRCS 2007
Bent-flowered milkvetch	<i>Astragalus vexilliflexus</i>	ND SOC	This perennial is rare but common where found. It occurs on rocky prairie knolls and ridges.	Rocky knolls and ridges	Yes	No	Slope Stark	NDNHI 2007; Kantrud 1995; USDA, NRCS 2007; NDGFD 2007
Narrow-leaved wirelettuce	<i>Stephanomeria tenuifolia</i>	ND SOC	Open, dry, often rocky areas in the foothills to moderate elevations. Blooms in June through September.	Open, dry areas	Yes	No	Stark Slope Bowman	NDNHI 2007; USDA, NRCS 2007
Slim flowered scurfpea	<i>Psoralea tenuiflora</i>	ND SOC	This species occurs within dry prairies and open woodlands. This species is drought tolerant and prefers well-drained soils.	Dry prairies	Yes	No	Bowman	NDNHI 2007; NatureServe 2007; USDA, NRCS 2007
Torrey's cat's-eye	<i>Cryptantha torreyana</i>	ND SOC	This annual is common in open areas at low to mid-elevation ranges in the mountains. Flowers from May to July.	Open areas	Yes	No	Bowman	NDNHI 2007; NatureServe 2007; BMNHC 2007; USDA, NRCS 2007

Table A-1 Special Status Species

Species	Scientific Name	Status ¹	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
White locoweed	<i>Oxytropis sericea</i>	ND SOC	This perennial occurs on open, well-drained slopes of the western plains. It is infrequent to common on prairie uplands, streambanks, valleys, and alpine sites. It occurs on sandy, gravelly, or rocky soils but grows best on sandy loams. It is tolerant of moderately saline soils and low nutrient conditions but does not tolerate water-saturated soils such as heavy clay. White locoweed is drought tolerant but is not tolerant of excessive shade. It is tolerant to freezing temperatures during the growing season and competes well on nutrient-rich, deep loam on subalpine sites. White locoweed thrives at medium elevations. First bloom for white locoweed occurs in mid-June to early July. Seed dissemination begins in mid-July and lasts until mid-August. The plant begins to dry in late September.	Open slopes of the plains	Yes	No	Slope	NDNHI 2007; Esser 1993.

¹FE = Federally Endangered, ND Level I, II, III = North Dakota Level I, II, III Species of Conservation Priority, ND SOC = North Dakota Species of Concern.

Appendix B

Notification

**Belfield to Rhame Transmission Project
EA Notification List
July 3, 2007**

Federal Agencies

U.S. Fish and Wildlife Services

Field Supervisor for Ecological Services
U.S. Fish and Wildlife Service
3425 Miriam Avenue
Bismarck, ND 58501-7926

U.S. Army Corps of Engineers

Col. David Press
District Commander
Omaha District, Corps of Engineers
106 South 15th Street
Omaha, NE 68102-1618

Federal Emergency Management Agency

Mr. Bob Cox
Regional Environmental Officer
Federal Emergency Management Agency
Department of Homeland Security
P.O. Box 25267
Denver, CO 80225-0267

Federal Aviation Administration

Christopher R. Blum
Regional Administrator
Federal Aviation Administration
Great Lakes Region
O'Hare Lake Office Center
2300 East Devon Avenue
Des Plaines, IL 60018

Federal Highway Administration

Mr. Ronny Hartel
Federal Highway Administration
1471 Interstate Loop
Bismarck, ND 58503-0567

Environmental Protection Agency, Region 8

Mr. Larry Svoboda
Director, NEPA Program – 8EPR-N Mail Code
Office of Ecosystem Protection and Remediation
U.S. Environmental Protection Agency
999 18th Street, Suite 300
Denver, CO 80202-2466

Natural Resource Conservation Service

J. L. Flores
State Conservationist
North Dakota NRCS State Office
Natural Resources Conservation Service
220 East Rosser Avenue
Federal Building, Room 270
Bismarck, ND 58501

Farm Service Agency

Gary Nelson
State Executive Director
North Dakota State Farm Service Agency
1025 28th St. S
Fargo, ND 58103-2372

Lavonne Wegner
County Executive Director
Bowman County Farm Service Agency (serving Slope County)
111 2nd Ave. NW
Bowman, ND 58623-4333

Pete Solemsaas
County Executive Director
Stark County Farm Service Agency
2493 4th Ave. W. Room B
Dickinson, ND 58601-2623

Mr. Eugene Zimmerman
County Executive Director
Stark County Farm Service Agency
319 Brown Avenue
Mott, ND 58103-2372

North Dakota Congressional Delegation

The Honorable Earl Pomeroy
Room 328, Federal Building
220 East Rosser Avenue
Bismarck, ND 58501

The Honorable Byron Dorgan
312 Federal Building
P.O. Box 2579
Bismarck, ND 58502

The Honorable Kent Conrad
U.S. Federal Building, Room 228
220 East Rosser Avenue
Bismarck, ND 58501

State Agencies

North Dakota Department of Agriculture

Mr. Roger Johnson, Commissioner
North Dakota Department of Agriculture
600 E. Boulevard Ave., Dept 602
Bismarck, ND 58505-0020

North Dakota Forest Service

Commissioner
North Dakota Forest Service
Molberg Center
307 First Street East
Bottineau, ND 58318

North Dakota Game and Fish Department

Mr. Terry Steinwand, Director
North Dakota Game and Fish Department
100 N. Bismarck Expressway
Bismarck, ND 58501-5095

North Dakota State Historical Board

Mr. Marvin L. Kaiser, President
North Dakota State Historical Board
612 East Boulevard Avenue
Bismarck, ND 58505-0830

North Dakota Indian Affairs Commission

Ms. Cheryl Kulas, Executive Director
North Dakota Indian Affairs Commission
600 East Boulevard Avenue
1st Floor Judicial Wing, Room #117
Bismarck, ND 58505

North Dakota State Land Department

Director
North Dakota State Land Department
1707 North 9th Street
P.O. Box 5523
Bismarck, ND 58506-5523

North Dakota Department of Transportation

Mr. Francis G. Ziegler, Director
North Dakota Department of Transportation
608 East Boulevard Avenue
Bismarck, ND 58505

North Dakota Department of Commerce

Mr. Paul Govig, Director
North Dakota Department of Commerce
Division of Community Services
Century Center
1600 East Century Avenue, Suite 2
Bismarck, ND 58503

North Dakota Public Service Commission

Ms. Susan E. Wefald, President
Public Service Commission
600 E. Boulevard, Dept. 408
Bismarck, ND 58505-0480

North Dakota Transmission Authority

Sandi Tabor, Acting Director
North Dakota Transmission Authority
State Capitol, 14th Floor
600 E. Boulevard Ave., Dept. 405
Bismarck, ND 58505-0840

North Dakota Department of Health

L. David Glatt, PE, Chief
Environmental Health Section
North Dakota Department of Health
918 East Divide Avenue
Bismarck, ND 58501-1947

North Dakota State Legislature

Senator Herb Urlacher, District 36
3320 94th Avenue SW
Taylor, ND 58656-9643

Senator Bill L. Bowman, District 39
408 First Street, SW
Bowman, ND 58623

Representative David Drovdal, District 39
2802 1331st Avenue NW
Arnegard, ND 58835-9127

Representative Keith Kempenich, District 39
9005 151st Avenue SW
Bowman, ND 58623-8857

Representative C. B. Haas, District 36
3519 94th Avenue SW
Taylor, ND 58656-9646

Representative Shirley Meyer, District 36
4025 Highway 22
Dickinson, ND 58601-9509

County

Slope County, North Dakota
County Commissioners
Paul Brooks, Chair
Michael Sonsalla, Mike Teske
County Courthouse
206 S. Main Street
Amidon, ND 58620-0000

Bowman County, North Dakota
County Commissioners
Kenneth Steiner, Chair
Pine Abrahamson, Bill Bowman
County Courthouse
104 1st Street NW
Bowman, ND 58623

Stark County, North Dakota
County Commissioners
Duane Wolf, Chair
Russ Hoff, George Nodland, Chester Willer, Ken Zander
County Courthouse
51 3rd Street East
Dickinson, ND 58601

Municipalities

City Administrator
City of Bowman
606 1st Street SW
Bowman, ND 58623-4461

Greg Sund, City Administrator
City of Dickinson
99 2nd Street East
Dickinson, ND 58601-5222

City Administrator
City of New England
9 East 7th Street
New England, ND 58647-7137

City Administrator
City of South Heart
103 6th Street NW
South Heart, ND 58655-7116

City Administrator
City of Rhame
53 Main Street
Rhame, ND 58651
City of Amidon
Ronald Clendenen
Amidon, ND 58620

Organizations

Executive Director
Ducks Unlimited
3502 Franklin Avenue
Bismarck, ND 58501

Executive Director
Nature Preserves Program
North Dakota Parks and Recreation Department
1835 Bismarck Expressway
Bismarck, ND 58504

Executive Director
The Nature Conservancy
P.O. Box 1156
Bismarck, ND 58502-1156

Sierra Club, Dacotah Chapter
Executive Director
311 E. Thayer Ave., Suite 113
Bismarck, ND 58501

Tribes

Eastern Shoshone Tribe:

Mr. Ivan Posey, Chairman
Shoshone Business Council
P.O. Box 538
Fort Washakie, WY 82514
(307) 332-3532 or 4932

cc:

Arlen Shoyo
Shoshone Business Council
P.O. Box 538
Fort Washakie, WY 82514
(307) 332-3532 or 4932

Ms. Reba Tehran
Shoshone Cultural Office
P.O. Box 1008
Fort Washakie, WY 82514

Northern Arapaho Tribe:

Mr. Richard Brannan, Chairman
Arapaho Business Council
P.O. Box 396
Fort Washakie, WY 82514
(307) 332-6120 or (307) 856-3461
FAX (307) 332-7543
E-mail: arapahotribe@hotmail.com

cc:

Ms. JoAnn White
Tribal Historic Preservation Officer
Northern Arapaho Tribe
P.O. Box 1056
Fort Washakie, WY 82514
cell: (307) 851-9617

Northern Cheyenne Tribe:

Mr. Eugene Littlecoyote, President
Northern Cheyenne Tribal Council
P.O. Box 128
Lame Deer, MT 59043
(406) 477-6284

cc:

Mr. Conrad Fisher
Tribal Historic Preservation Officer
P.O. Box 128
Lame Deer, MT 59043
(406) 477-6035

Mr. Steven Brady
Traditional Spokesperson
P.O. Box 542
Lame Deer, MT 59043
(406) 477-8344

Oglala Lakota Nation:

Ms. Cecelia Firethunder, President
Oglala Sioux Tribal Council
P.O. Box H
Pine Ridge, SD 57770
(605) 867-5821
Fax (605) 867-5659

Rosebud Sioux Tribe:

Mr. Rodney Bordeaux President
Rosebud Sioux Tribal Council
P.O. Box 430
Rosebud, SD 57570
(605) 747-2381
Fax (605) 747-2243

cc:

Mr. Russell Eagle Bear, THPO
Rosebud Sioux Tribe of Indians
P.O. Box 809
Rosebud, SD 57570
605-747-4225

Cheyenne River Sioux Tribe:

Mr. Herold Frazier, Chairman
Cheyenne River Sioux Tribal Council
P.O. Box 590
Eagle Butte, SD 57625
(605) 964-4155
Fax (605) 964-4155

cc:

Albert Lebeau
Tribal Historic Preservation Officer
Cheyenne River Sioux Tribe
P.O. Box 590
Eagle Butte, SD 57625
(605) 964-7554

Standing Rock Sioux:

Mr. Ron His-Horse-is-Thunder, Chairman
Standing Rock Sioux Tribal Council
P.O. Box D
Fort Yates, ND 58538
(701)-854-7448

cc:

Mr. Tim Mentz
Tribal Historic Preservation Officer
P.O. Box D
Fort Yates, ND 58538
(701) 854-2120

Crow Tribe:

Mr. Carl Venne, Chairman
Crow Tribal Council
P.O. Box 159
Crow Agency, MT 59022
(406) 638-3708
Fax (406) 638-7283

cc:

Mr. Darrin Old Coyote
Cultural Director
Crow Tribal Administration
P.O. Box 159
Crow Agency, MT 59022
(406) 638-3793

Fort Peck Tribes:

Mr. John Morales, Chairman
Ft. Peck Tribes
P.O. Box 836
Poplar, MT 59255

cc:

Mr. Curley Youpee, THPO
Ft. Peck Tribes
P.O. Box 836
Poplar, MT 59255

Three Affiliated Tribes:

Marcus D. Wells, Chairman
Three Affiliated Tribes Business Council
404 Frontage Road
New Town, ND 58763
701-627-4781

Appendix C

Agency Correspondence



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501



JUL 24 2007

Mr. Nicholas J. Stas, Environmental Manager
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, Montana 59107-5800

Dear Mr. Stas:

The U.S. Fish and Wildlife Service (Service) has reviewed Western Area Power Administration's (Western) July 5, 2007, letter regarding notification of Western's plans to prepare an Environmental Assessment (EA) for construction of a 230-kilovolt (kV) transmission line. Basin Electric Cooperative (Basin) is proposing to construct the transmission line from Western's Belfield Substation in Stark County, to the new Rhame Substation to be located along the existing Little Missouri-Bowman 230-kV line in the vicinity of the town of Rhame, North Dakota. Basin has requested an interconnection with Werter's transmission system at the Belfield Substation. This interconnection request is a federal action which requires a National Environmental Policy Act (NEPA) review. The Service requests the opportunity to review the Draft EA. We offer the following comments under the authority of and in accordance with the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.) and the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.).

As part of the National Wildlife Refuge System, the Service administers fee title Refuge and Waterfowl Production Areas, as well as wetland and grassland easements, throughout North Dakota. A review of our county plat maps indicate no Service property interests are located within in the proposed project corridor.

Our review of the National Wetland Inventory (NWI) maps and photographs indicate the proposed planning areas include numerous water features. Our primary environmental concern is with construction through wetlands and stream channels. The Service recommends for overhead lines that poles and other construction be sited to avoid placement of fill in wetlands and stream channels along the route.

To minimize disturbance to fish and wildlife resources in the project area, the Service provides the following recommendations:

- Defer the timing of construction to late summer (after July 15) or fall so as not to disrupt wildlife during the nesting season.

- 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.
- Reseed disturbed areas with a mixture of native grass and forb species.

If construction routes intersect wetlands, streams, or rivers, the Corps of Engineers (Corps) may require a Department of the Army permit for the placement of dredge or fill material into waters of the U.S., including wetlands, or other impacts to navigable waters. We suggest you contact Mr. Daniel Cimarosti, Regulatory Office, Corps of Engineers, 1513 South 12th Street, Bismarck, North Dakota 58504 (701-255-0015), to determine the Corps' permit requirements.

To minimize the electrocution hazard to birds, the Service, with support from the Rural Utilities Service, recommends that new or updated overhead power lines be constructed in accordance with the current guidelines for preventing bird electrocutions. The recommended guidelines can be found in "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006". To increase power line visibility and reduce bird fatalities resulting from collisions with power lines, the Service recommends power lines that cross or run adjacent to rivers or large wetlands be modified according to "Mitigating Bird Collisions with Power Lines: The State of the Art in 1994". Both publications can be obtained by writing or calling the Edison Electric Institute, P.O. Box 266, Waldorf, Maryland 20604-0266, (1-800-334-5453) or visiting their website at www.eei.org.

Bowman, Slope, and Stark Counties are on the western edge of the known whooping crane migratory route through North Dakota. The following table contains records of confirmed whooping crane sightings in Bowman, Slope, and Stark Counties through 2004 (U.S. Fish and Wildlife Service unpublished data).

County	# ADULTS	# JUVENILES	TOTAL BIRDS	YEAR	LATITUDE	LONGITUDE	LEGAL DESCRIPTION	SEASON
Bowman	2	0	2	2002	4608	10306	T131N,R99W,S29	Fall
Slope	2	1	2	1982	4622	10305	T134N,R99W,S35,NE4	Fall
Stark	2	0	3	1977	4655	10226	T140N,R93WN,R80W,S25	Fall

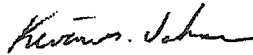
Every effort should be made to protect whooping cranes from colliding with new or existing electric transmission lines in the project area. To assist Western in protecting whooping cranes, the Service is enclosing an issue paper authored by Thomas V. Stehn and Tom Wassenich that provides background on the issue and seeks to promote actions to reduce whooping crane mortality from collisions with utility lines. We encourage Western to consider the information presented in Whooping Crane Collisions with Power Lines: an Issue Paper in their determination of the potential effects to whooping cranes from the proposed project.

A current list of federally endangered and threatened species that may be present within the proposed project's area of influence is enclosed. This list fulfills requirements of the Service under Section 7 of the Endangered Species Act.

If a Federal agency authorizes, funds, or carries out a proposed action, the responsible Federal agency, or its delegated agent, is required to evaluate whether the action "may affect" listed species. If the Federal agency determines the action "may affect" listed species, then the responsible Federal agency shall request formal section 7 consultation with this office. If the evaluation shows a "no effect" determination for listed species, further consultation is not necessary. If a private entity receives Federal funding for a construction project, or if any Federal permit is required, the Federal agency may designate the fund recipient or permittee as its agent for purposes of section 7 consultation.

Thank you for the opportunity to comment on this project. If you require further information or the project plans change, please have your staff contact Terry Ellsworth of my staff or contact me directly at (701) 250-4481, or at the letterhead address above.

Sincerely,



Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

Enclosures

cc: Regulatory Office, Army Corps of Engineers, Bismarck
(Attn: D. Cimarosti)
Director, ND Game and Fish Dept., Bismarck
(Attn: M. McKenna)

References

- McCabe, T.L. 1981. The Dakota skipper, *Hesperis dacotae* (Skinner): range and biology, with special reference to North Dakota. *Journal of the Lepidopterist' Society* 35(3):179-193.
- Royer, R.A. and G.M. Marrone. 1992. Conservation status of the Dakota skipper (*Hesperis dacotae*) in North and South Dakota. Unpublished report, U.S. Fish and Wildlife Service, Denver, CO. 15 March 1992. 44+pp.

FEDERAL THREATENED AND ENDANGERED SPECIES
FOUND IN STARK COUNTY
NORTH DAKOTA
July 2007

ENDANGERED SPECIES

Birds

Whooping crane (Grus Americana): Migrates through west and central counties during spring and fall. Prefers to roost on wetlands and stockdams with good visibility. Young adult summered in North Dakota in 1989, 1990, and 1993. Total population 140-150 birds.

Mammals

Black-footed ferret (Mustela nigripes): Exclusively associated with prairie dog towns. No records of occurrence in recent years, although there is potential for reintroduction in the future.

Gray wolf (Canis lupus): Occasional visitor in North Dakota. Most frequently observed in the Turtle Mountains area.

THREATENED SPECIES

Birds

Bald eagle (Haliaeetus leucocephalus): Migrates spring and fall statewide but primarily along the major river courses. It concentrates along the Missouri River during winter and is known to nest in the floodplain forest.

WHOOPING CRANE COLLISIONS WITH POWER LINES:
AN ISSUE PAPER

THOMAS V. STEHN, U. S. Fish and Wildlife Service, P.O. Box 100, Austwell, TX
77950

TOM WASSENICH¹, Texas State University - San Marcos, Texas 78666

Introduction

The whooping crane (*Grus americana*) is one of the most widely known endangered species in North America and symbolizes the struggle to maintain the vanishing creatures of this world. Collision with power lines is the greatest source of mortality for fledged whooping cranes in the Aransas-Wood Buffalo population (AWBP) that migrate from nesting grounds in the Northwest Territories, Canada through the central U. S. to winter on the Texas coast (Fjetland 1987, Lingle 1987, Lewis et al. 1992). Such mortality affects the recovery of this endangered species and accentuates the need to minimize such losses (Howe 1989). Power line expansion in North America remains one of the chief threats to the species (USFWS 1994). This paper provides background on the issue and seeks to promote actions to reduce whooping crane mortality from collisions with utility lines.

Environmental concerns of the public about bird collisions have grown with the expansion of electric utilities that has multiplied miles of lines to meet increased demand for electric power (APLIC 1994). In an attempt to begin addressing both collision (specifically whooping cranes) and electrocution problems, an ad hoc committee represented by several investor-owned electric utilities (IOUs), the National Audubon Society, and the U.S. Fish and Wildlife Service (USFWS) was created in 1983. By 1989, a more formal relationship was established with the creation of the Avian Power Line Interaction Committee (APLIC) composed then of nine IOUs and USFWS, with technical advice from staff of the National Audubon Society, Clemson University, and the University of Idaho (Lewis 1997). APLIC was housed in the IOU trade association Edison Electric Institute (EEI), Washington, D.C. (Huckabee 1993). APLIC has served as a clearinghouse for information and communication on avian and powerline interaction issues. Currently, APLIC is composed of electric utilities, utility organizations, and Federal agencies involved in bird and power line interaction issues.

I would like to thank Albert Manville and Wendy Brown of USFWS for providing their expertise on the issues and Marty Folk, Florida Fish and Wildlife Conservation Commission for providing data on the Florida population. The views in this paper are those of the authors and do not necessarily reflect the views of the U. S. Fish and Wildlife Service.

¹ Current address is 11 Tanglewood, San Marcos, TX 78666.

Species Status

There were once over 10,000 whooping cranes in North America that ranged from the Rocky Mountains to the Atlantic Coast and from northern Canada to Mexico (CWS and USFWS 2005). Population numbers declined to the brink of extinction from shooting, the destruction of nesting and migration habitat due to drainage of wetlands for farming, and collection of eggs and specimens as the species became increasingly rare. In 1941, only 15 individuals remained in the AWBP, the only migratory population that survived. Since yearly census estimates were initiated in 1938, the growth of this population has averaged 4.5% annually and numbered 215 in spring, 2005.

Until the whooping crane population grows to at least 1,000 individuals, the species is in a race against time as the limited genetic material that survived the bottleneck continues to be lost in each generation (CWS and USFWS 2005). Thus, it is important to accelerate the rate of species recovery to minimize genetic loss. Also, with the very restricted range of the AWBP in both summer and winter, chances of species survival in case of a catastrophic event would be increased if additional populations were established (USFWS 1994). Attempts from 1975-1989 to establish a whooping crane flock in the Rocky Mountains using cross-fostering with whooping crane eggs placed in sandhill crane (*G. canadensis*) nests were unsuccessful, with high flock mortality and no attempts at breeding due to improper sexual imprinting of the whooping cranes.

The current range of the whooping crane is shown in Figure 1. A non-migratory flock in Florida started in 1993 numbered about 60 birds in August, 2005. Adults in this flock have paired, nested and fledged young, but mortality continues to be high and is preventing population growth (CWS and USFWS 2005). An eastern migratory flock started in 2001 that uses ultralight aircraft to teach juvenile whooping cranes a migration between Wisconsin and Florida numbered 66 birds in August, 2005. At that time, there were 481 whooping cranes in North America, including 3 wild flocks and 139 birds in captivity. Three major captive breeding flocks produce 25-40 young annually for reintroductions.

Problem

Rural electrification in North America resulted in the proliferation of power lines into areas traditionally used by migratory birds, resulting in substantial whooping crane mortality in migration (Brown et al. 1987, USFWS 1994). At the present time, with a growing U.S. population, industrial expansion and public demand for more electricity, additional power lines are being installed (Manville 2005). This will increase the potential for whooping crane collision mortalities. The most recent nationwide estimates indicate that there are more than 500,000 miles (804,500 km) of bulk transmission lines in the U.S. (APLIC 1996, Harness 1997, Edison Electric Institute 2000). Transmission lines in the U.S. carry $\geq 115,000$ volts/115 kV, with conductors attached to either tall wood, concrete or steel towers. Distribution lines (those in the U.S. carrying $\leq 69,000$ volts/69 kV) are constructed on 11-15 m (36-49 ft) wooden, steel, or concrete poles, typically configured with one, two, or three energized (phase) wires and one neutral (grounded) wire. Williams (2000) cited the figure of 116,531,289 distribution poles in the U.S. but listed no figure for wire length. Because of rapid expansion, new development, and jurisdictional issues, no good accounting of the total amount of distribution line is available for the U.S.; it is certainly in the millions of kilometers (Manville 2005).

Cranes and other birds apparently collide with lines because they do not see them in time to avoid them and suffer traumatic injury from the collision itself, or from the resulting impact falling to the ground (Brown et al. 1984). Non-conducting groundwires, usually installed above conductor wires to intercept lightning strikes and prevent power outages, are the wires most often struck by birds in flight (Scott et al. 1972, Willard et al. 1977, Ward and Anderson 1992). Because groundwires are normally 0.9-1.3 cm (0.4-0.5 in) in diameter and smaller than conductor wires, they sometimes appear to be invisible because of background or lighting conditions. Consequently, birds often see and avoid conductor wires only to strike the less visible groundwires (Brown et al. 1987, Faanes 1987, Ward and Anderson 1992), and are more prone to strike wires mid-span rather than near utility poles (Ward et al. 1996).

Collisions with transmission and distribution power lines can be a significant source of mortality for bird populations and may kill annually anywhere from hundreds of thousands to 175 million birds in the U.S. based on extrapolations by Koops (1987) and Erickson et al. (2001). The range of values is so large because of poor monitoring of utilities for strikes (Manville 2005). Faanes (1987) observed 7,000 flights of all types of birds near prairie wetlands and lakes in North Dakota. He observed about a 1% collision rate and estimated 124 avian fatalities/km/yr (200/mile/yr). He also counted dead birds under power lines and found 122 dead in the fall and 511 in the spring.

Sandhill cranes, a species closely related to whooping cranes that can serve as a surrogate species to study the problem, suffer appreciable mortality from collision with power lines (Morkill and Anderson 1991). Line collisions resulted in 36% of the known mortality to fledged sandhill cranes in the Rocky Mountains (Drewien 1973). Whooping cranes are presumably even more susceptible to striking power lines than sandhill cranes (Morkill and Anderson 1991) because of their larger body size and wing span, slower wing beat, and relative lack of maneuverability. Juveniles are more vulnerable to collisions than adults, presumably due to lack of experience and flight skills (Ward et al. 1986, Brown et al. 1987, Ward and Anderson 1992, APLIC 1994, Brown and Drewien 1995). Archibald (1987) found that 2.1% of adults and 13.4% of chicks of red-crowned cranes (*G. japonensis*) were killed striking powerlines. Janss and Ferrer (2000) estimated mortality from power line collisions for a wintering population of common cranes (*G. grus*) in Spain. The collision rate (i.e. number of cranes hitting a power line / number of

cranes crossing a power line) was 3.93×10^{-5} and minimum annual collision mortality was 2.36/km/yr (1.47/mi/yr). Morkill and Anderson (1991) observed 3.4 sandhill crane collisions / km (5.4/mi), as reported in Janss and Ferrer (2000).

Most studies have concluded that collision with power lines is not a major threat to bird populations but may be more of a problem for large birds (APLIC 1994). Crivelli et al. (1988) estimated a 1.3-3.5% decrease of dalmation pelicans (*Pelecanus crispus*) in the breeding population from collisions. Collisions caused 44% of the mortality of fledged trumpeter swans (*Cygnus buccinator*) in Wyoming (Lockman 1988).

Collisions become biologically significant when they affect a bird population's ability to sustain or increase its numbers, a problem that may be especially acute with endangered species (APLIC 1994). Whooping crane mortality from striking utility lines may be biologically significant to a small, endangered population and lower the probability of survival for the entire population (Wassenich 2003a). Collisions with power lines are known to have accounted for the death or serious injury of at least 43 whooping cranes since 1956 (Table 1). Of 18 documented mortalities of fledged whooping cranes in the reintroduced Rocky Mountain population prior to 1987, 8 (39%) were a result of collisions with power lines (Brown et al. 1987) (Table 2). Twenty individuals out of a total of 166 known causes of mortality (12%) of the nonmigratory Florida whooping crane population, and two out of eleven cases (18%) of post-release mortality in the migratory Wisconsin population, have been from collisions with power lines (T. Stehn, unpublished data). The percentage of whooping crane mortality caused by collisions with power lines is hard to extrapolate for the AWBP because of the less intense monitoring done on that population compared to reintroduced flocks. In the 1980's, 2 of 9 radio-marked juvenile whooping cranes in the AWBP died within the first 18 months of life as a result of power line collisions, 33% of the total post fledging losses of the radioed birds (Kuyt 1992). Five of 13 known causes of mortality (38%) for the AWBP between the months of April and November, 1950 to 1987 resulted from collisions with utility lines (Lewis et al. 1992). During that same period, total mortality equaled 133 cranes. (Lewis et al. 1992). Extrapolating from the known causes of mortality, an estimated 51 of the 133 whooping cranes (38%) may have been killed colliding with power lines. Whereas predation by bobcats has been the primary source of mortality for the nonmigratory Florida whooping cranes, predation of fledged whooping cranes is thought to be uncommon in the AWBP (CWS and USFWS 2005).

Table 1. Known Mortalities from Whooping Crane Collisions with Power Lines

Aransas-Wood Buffalo Flock

#	Date	Province/ State	County	Site	Died	Age	Sex	Wire	Notes
1	May 56	TX	Lampasas	-	No ^A	YRL	F	transmission	clear skies
2	Nov 65	KS	Rawlins	Ludell	Yes	A	F	distribution (3-wire)	clear skies
3	Apr 67	KS	Russell	Dorrance	Yes	A	F	distribution (3-wire)	clear skies
4	Oct 81	SK	-	Glaslyn	Yes ^B	JUV	-	distribution (1-wire, 30 ft)	in barley field
5	Oct 82	TX	Coryell	Oglesby	Yes	A	F	distribution (4-wire, 20-25 ft)	clear, in maize
6	Oct 88	NE	Howard	St. Paul	No ^C	A	-	distribution (2-wire, 35 ft)	corn granary
7	Oct 89	NE	Hitchcock	Stratton	Yes	YRL	M	distribution (12 kV)	wheat by wetland
8	Oct 97	SK	-	Zelma	Yes	SA	-	distribution (1-wire 14.4 kV)	agricultural field
9	Apr 02	TX	-	DeLeon	Yes	A	F	distribution line	

Rocky Mountain Flock

#	Date	State	County	Site	Died	Age	Sex	Wire	Notes
1	May 77	WY	Uinta	Lonetree	Yes ^D	JUV	M	distribution	roadside
2	Apr 81	CO	RioGrande	MonteVista	Yes	JUV	-	distribution (69kV)	barley
3	Oct 82	CO	Alamosa	Alamosa	No ^E	A	-	transmission (115 kV)	
4	Mar 83	CO	Alamosa	Alamosa	Yes	A	F	transmission (115 kV)	(hit same line as # 3)
5	Apr 84	CO	Alamosa	Alamosa	Yes	JUV	-	distribution (69kV)	high winds, barley
6	Apr 84	CO	Mesa	Grand Junction	No ^F	JUV	-	unknown	
7	May 84	CO	-	Monte Vista	Yes	JUV	-	possible distribution (69 kV)	
8	Sept 85	ID	Caribou	Grays Lake	Yes	JUV	M	transmission	died 10-2-85 from injuries
9	Apr 86	ID	Bancock	Oxford Slough	Yes	A	M	unknown	wetland
10	fall 87	CO		San Luis Valley	Yes	JUV	-	unknown	bird diagnosed with tuberculosis
11	Mar 89	CO		San Luis Valley	Yes	A	F	unknown	
12	Mar 98	CO	Alamosa	Monte Vista	Yes	A	F	transmission	
13	Mar 00	CO	Rio Grande	Monte Vista	Yes	A	F	distribution	

A = adult, JUV=juvenile, SA = subadult, YRL=yearling, F=female, M=male

2-10

Florida Nonmigratory Flock

#	Date	State	County	Site	Died	Age	Sex	Wire	Notes
1	Jan 97	FL	Osceola	Escape	Yes ^G	JUV	M	distribution	along dirt road
2 ^H	Nov 97	FL	Brevard	Sartori	Yes	SA	M	distribution (4-wire)	by road
3 ^H	Nov 97	FL	Brevard	Sartori	Yes	SA	M	distribution (4-wire)	by road
4 ^H	Nov 97	FL	Brevard	Sartori	Yes	SA	M	distribution (4-wire)	by road
5	Mar 98	FL	Lake	Geraci	Yes	SA	M	distribution	
6	Feb 99	FL	Lake	Geraci	Yes	JUV	M	distribution (3-wire)	
7	Jan 01	FL	Lake	Groveland	Yes	A	M	distribution (4-wire)	
8	Mar 02	FL	Polk	Lake Wales	Yes	JUV	F	distribution	
9	Mar 03	FL	Sumter	Bexley	Yes	JUV	M	transmission ^I	
10	Aug 03	FL	Polk	Lake Wales	Yes	A	M	distribution	
11	Dec 03	FL	Lake	Pruitt	Yes	JUV	F	transmission ^I	
12	Nov 04	FL	Sumter	Bexley	Yes	SA	M	transmission ^I	
13 ^J	Jan 05	FL	Lake	Pruitt	Yes	SA	F	transmission ^I	
14	Feb 05	FL	Lake	Pruitt	Yes	SA	F	transmission ^I	
15	Mar 05	FL	Sumter	Hi Acres	Yes	SA	F	transmission ^I	
16	Mar 05	FL	Lake	Pruitt	Yes	SA	M	transmission ^I	
17	Apr 05	FL	Osceola	Holopaw	Yes	A	M	transmission	
18	Aug 05	FL	Sumter	Pruitt	Yes	SA	M	transmission	
19	Dec 05	FL	Polk	--	Yes	A	M	transmission	
20	May 06	FL	Lake/Sumter	near Pruitt	Yes	A	M	transmission	

Wisconsin-Florida Migratory Flock

Date	State	County	Site	Died	Age	Sex	Wire	Notes
1 ^K	Oct 01	WI	Green	-	Yes	JUV	M	distribution windstorm, collision at night
2	July 05	WI	Green Lake	-	Yes	SA	M	transmission

- A Injured and had to be kept in captivity (named Rosie) and bred.
- B Injured bird died while being transported to captivity.
- C Bird fell to ground and flew off after 5-10 minutes. Postulated it was 1 of birds that failed to show up on wintering grounds that fall.
- D Collision could have been from power line, vehicle, or fence, but believed to be power line.
- E Fractured tarsus. Continued migration, but never recovered with abnormal behavior.
Died 1-20-83.
- F Upper elbow injury required amputation. Placed in captivity.
- G Cause of death considered as probable powerline. However, necropsy could not rule out being struck by a car on the roadway next to the power line.
- H Three whooping cranes killed in the same incident.
- I This major transmission line follows the border of Lake/Sumter County and has been hit in multiple incidents.
- J Radio found hanging from power line and bird disappeared indicating mortality.
- K Strike occurred at a migration stopover at night when the crane escaped from a pen during a storm.

Table 2. Percent causation of known mortality from powerline strikes of fledged birds in whooping crane populations.

Whooping Crane Population	Number of Documented Mortalities from Power Lines	% Mortality of Fledged Birds	Source
Rocky Mountain	13	39	Brown et al. 1987
Florida nonmigratory	20	12	Stehn unpub. data
WI to FL migratory	2	18	Stehn unpub. data
AWBP radioed juveniles ^a	2 ^a	33	Kuyt 1992
AWBP all fledged birds ^b	5 ^b	38	Lewis et al. 1992

^a Two of 9 juveniles radioed between 1981-1984 died in power line collisions.

^b Losses that occurred between April and November, 1950-1987.

Whooping cranes are no longer radio-tracked in migration between Texas and Canada. Color bands or radios have not been placed on AWBP whooping cranes since 1988. This is partly because of a mortality rate approaching 1% during capture of wild whooping cranes in Canada. Thus, data on power line strikes of AWBP whooping cranes are being obtained through chance observations as reported by the general public and agency personnel, and tabulated by the Whooping Crane Migration Cooperative Monitoring Project (CWS and USFWS 2005).

Crane Biology and Power Lines

Although migration involves only 17-20% of a whooping crane's annual activities, bird deaths are significantly greater during migration due to exposure to new hazards as birds travel through unfamiliar environments. Losses during migration may comprise 60-80% of annual mortality (Lewis et al. 1992). Whooping cranes normally migrate from 1,000 to 6,000 feet (305-1,829 m) above the ground (Kuyt 1992) and well above the height of power lines, but stop every night to roost in shallow wetlands (Howe 1989). With approximately 12-15 stopovers during each 4,000 km (2,486 mi) migration (Kuyt 1992), whooping cranes have multiple opportunities to encounter power lines.

When radiotracking whooping cranes in migration, T. Stehn (unpublished data) noted cranes were commonly seen at foraging sites with power lines nearby. Encounters with power lines usually occur as whooping cranes are making short, low altitude flights between foraging and roosting areas. These local flights frequently occur near sunrise and sunset when light levels are diminished.

For local flights, the proximity of power lines to locations where birds are landing and taking off is critical (Lee 1978, Thompson 1978, Faanes 1987). Power lines suspended across a river channel near crane roosts present hazardous obstacles to cranes flying after dark (Windingstad 1988, Morkill 1990). Power lines dividing wetlands used for roosting from grain fields used for feeding caused the most collisions for cranes because these circumstances encouraged crossing the lines at low altitude several times each day (Brown et al. 1987). Cranes frequently flew 10-15 m (33-49 ft) above the ground between fields; as a consequence, 12-m-high (39 ft) transmission lines obstructed their typical flight

path. No sandhill crane or waterfowl collisions were observed where distances from power lines to bird use areas exceeded 1.6 km (1 mi) (Brown et al. 1984, 1987).

Birds flying over power lines from adjacent roosting or foraging sites have less time and distance to react and avoid wires (Thompson 1978, Beaulaurier (1981), Brown et al. 1987, Scott et al. 1992). Observations of crane flight behavior by Morkill and Anderson (1991) indicated that crane flocks reacted more when flying less than 250 m (273 yd) before or after crossing a power line and were lower in altitude and increased their altitude to avoid the wires, similar to reactions of cranes observed by Brown et al. (1987). Flight distance was also related to height flown above wires; cranes flying less than 250 m (273 yd) before or after line crossing tended to fly 1-5 m (1.1- 5.5 yd) above the wires, but cranes flying more than 250 m (273 yd) tended to fly higher than 6 m (6.6 yd) above the wires (Morkill and Anderson 1991). Cranes were not observed to fly under transmission lines except occasionally when flushed near a line. Even at a 27-m-high (88.6 ft) study segment, cranes seemed reluctant to fly under the lines and instead flew vigorously upwards to cross over the wires (Morkill and Anderson 1991).

Cranes reacted more often to marked than unmarked spans, and more dead cranes were found under unmarked spans than marked spans (Morkill and Anderson 1991). When approaching marked spans, cranes commonly increased altitude farther than 5 m (5.5 yd) from the wires, suggesting they saw marker balls from a distance and avoided them. Cranes flared more often within 5 m (5.5 yd) of unmarked than marked spans, as if they were unaware of the unmarked wires (Morkill and Anderson 1991).

Collisions can occur under optimal weather conditions. One whooping crane at Monte Vista National Wildlife Refuge (NWR) in Colorado died apparently in good weather hitting a power line that it had crossed numerous times (R. Garcia, Alamosa NWR, Colorado, pers. comm.). However, inclement weather is one of the most frequently described factors affecting collisions and can increase the probability of collisions (Walkinshaw 1956, Avery et al. 1977, Willard et al. 1977, Anderson 1978). The weather conditions most associated with collisions are related to reduced visibility (fog, dense cloud cover, and precipitation), and reduced flight control (high-velocity winds) (APLIC 1994). Brown and Drewien (1995) found that wind was a significant factor increasing the frequency of sandhill cranes hitting utility lines. When flying in high-velocity winds, birds may be buffeted into fully visible power lines with which they are quite familiar, but which they cannot avoid because they cannot maintain flight control (Brown et al. 1987, Morkill and Anderson 1991, Raavel and Tomball 1991, Brown and Drewien 1995).

Whooping crane mortality does occur with birds striking both high transmission lines as well as low distribution lines in rural prairie areas. Manville (2005) found that much of the problem of bird collisions is associated with transmission lines. Ward and Anderson (1992) found sandhill cranes collided 4 times more frequently with transmission lines than distribution lines, although distribution lines were twice as abundant in their study area. Some studies have suggested that distribution lines are a greater threat for bird strikes because of their smaller size and lower visibility of conductors (Thompson 1978, Beaulaurier 1981, APLIC 1994).

For whooping cranes, more collisions have been documented on distribution lines (Wassenich 2003a), although this could simply reflect a greater frequency of encounters with distribution lines. Of the 41 known whooping crane mortalities, 14 hit transmission lines, 23 collided with distribution lines, and 4

were unknown. Exact geographic locations on many of the known whooping crane collisions with power lines were not recorded, with only general descriptions noted (i.e. location from nearest town). Thus, it is not possible to analyze the exact type of line or habitat in the vicinity of every known collision.

Power line strikes by whooping cranes do not always cause serious injury. One collision of a whooping crane in Florida was discovered when the bird's radio transmitter that had been attached to a plastic band on its leg was found dangling from a distribution line. The crane subsequently limped for a day with a swollen hock but recovered. One of the eastern migratory whooping cranes after being flushed by the public hit a distribution line in North Carolina in April 2004, but remained airborne and later rejoined the other birds it was migrating with. In 1983, a juvenile whooping crane hit a 115 kV line in the San Luis Valley, Colorado after being flushed by a landowner checking on his irrigation system. The bird was found under the line, struggling to stand, appearing dazed, but was able to fly off 30 minutes later and recovered. Increased hazard from human disturbance (e.g., flushing birds from farming activities, hunting, or intentional hazing of birds depredate crops) has been well-documented as a contributing factor to collisions (Krapu 1974, Blokpoel and Hatch 1976, Anderson 1978, Brown et al. 1984, Archibald 1987).

Recent Research

Wassenich (2003a) compiled and analyzed a database consisting of 30 known collisions between 1956 and 2002, updating a list initiated by Halvorson (1984). This was done in collaboration with T. Stehn as a first step to try to come up with a remedy for reducing the high rate of whooping crane/power line strikes. Subsequent to this list being compiled, there have been 11 additional whooping crane/utility line strike mortalities between 2002 and 2005 located in Florida (10) and Wisconsin (1) (Table 1). Collisions have occurred in 8 states and 1 province, with the most strikes in Colorado and Florida (Table 3).

Table 3. Locations of known whooping crane strikes with utility lines.

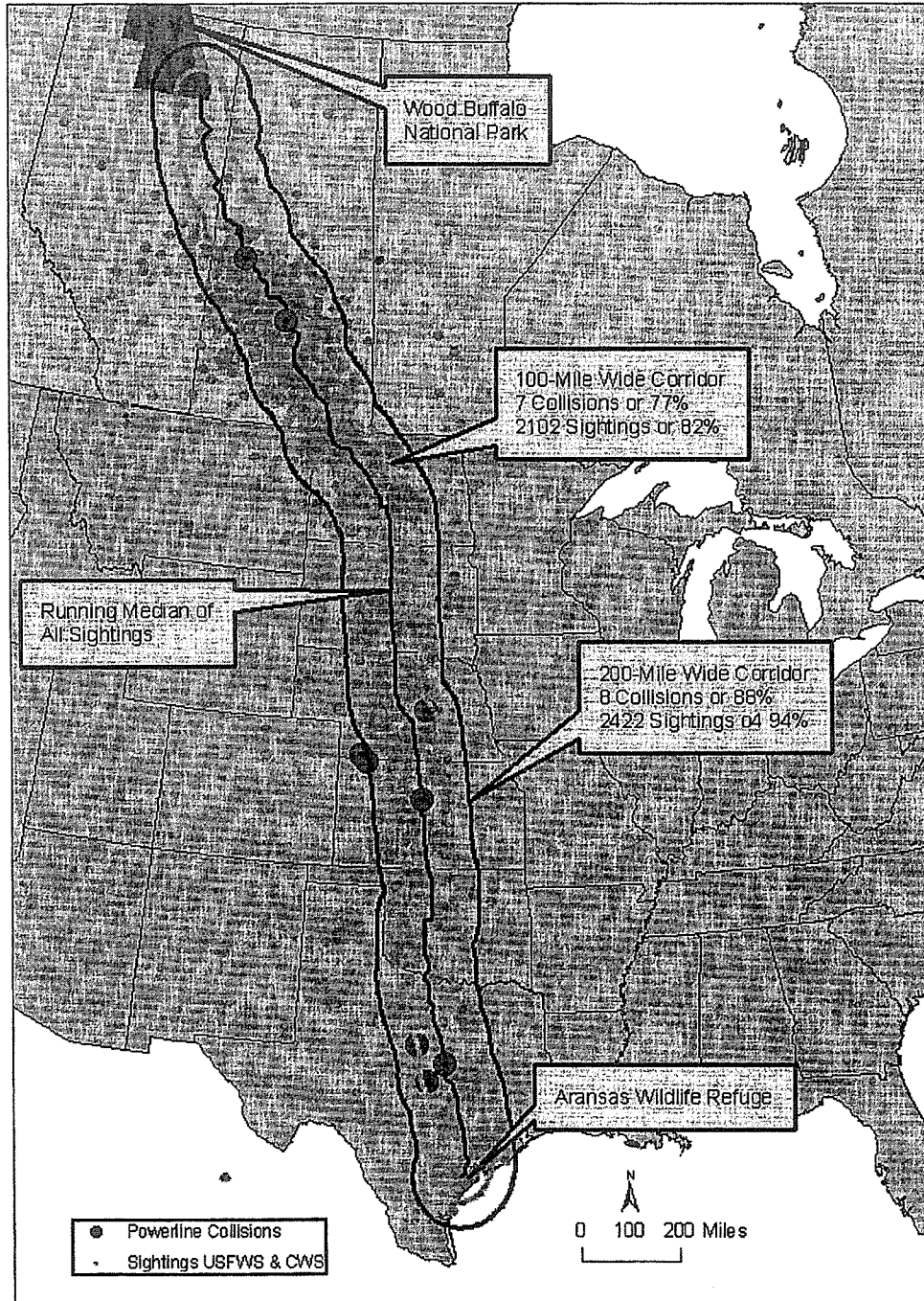
<u>Location</u>	<u>Number</u>
Saskatchewan	2
Colorado	10
Florida	17
Texas	3
Idaho	2
Kansas	2
Nebraska	2
Wisconsin	2
Wyoming	1
Total	41

In Colorado, 80% of total losses (n=10) occurred as cranes gathered together for a prolonged stopover during the spring migration, a behavior referred to as staging. Whooping cranes from the now extirpated Rocky Mountain population would spend from 4-6 weeks with sandhills during the spring migration in the San Luis Valley of Colorado, an area where most strikes occurred as power line density increased dramatically due to development of center pivot irrigation of agricultural fields. The high number of strikes in Florida (n=17) are from the resident Florida whooping crane population that have exposure to power lines throughout the year, whereas the AWBP usually only has exposure to lines during migration. The AWBP stages in the fall in southcentral Saskatchewan.

The difficulty for protecting whooping crane in the AWBP comes from deciding which lines to mark for a species with a 2,500 by 200-mile (4,023 x 322 km) migration corridor that mostly does not use traditional stopover sites (Wassenich 2003a). It is hard to predict where whooping cranes will stop. Howe (1989) using telemetry data on migrating whooping cranes found that "individuals did not use the same stopovers in different migrations, and groups migrating independently rarely shared stopovers used by other groups". However, some locations considered to be traditional stopover sites are used by small groups of whooping cranes nearly annually (Austin and Richert 1999). Some of these are designated by law as Critical Habitat since they are areas considered as required for the survival of the species. Examples of critical habitat include Salt Plains NWR in Oklahoma, Quivira NWR in Kansas, and a 56-mile (90 km) stretch of the Platte River in Nebraska.

Collision locations and all known confirmed sightings of AWBP whooping cranes in the U.S. (n=1,100, Austin and Richert 1999) and Canada (n=1,600, Brian Johns 2003, Canadian Wildlife Service files, Saskatoon, Saskatchewan) were placed on a map using ArcGIS for visual analysis (Wassenich 2003b)(Fig. 2). SPSS 2003 statistical software was used to calculate a running median on all migration sighting data points to better define the whooping crane migration corridor. From the derived centerline of the migration pathway, corridors of various widths were defined to determine how many of the known collisions and total sightings occurred within that given corridor width. Results showed that a migration corridor 100 miles wide (161 km) contained 77% of known collisions and 82% of total sightings. Increasing the corridor width to 200 miles (322 km) accounted for 88% of known collisions and 94% of all sightings, an increase of only 12% of total sightings (Fig. 2). This type of information could be used to target which power lines to mark to more effectively reduce whooping crane mortality.

Figure 2. Power Line Collisions and Sightings in 100 and 200-Mile Corridors



Created by Tom Wassenich - Revised 2005

Management Actions

Power lines can sometimes be redesigned or altered when necessary to reduce collisions. However, marking is neither necessary nor appropriate over large areas with low bird-collision potential (APLIC 1994). Studies have concluded that marking lines is a highly effective way to reduce sandhill crane collisions in specific problem areas (Morkill 1990, Morkill and Anderson 1991, Brown and Drewien 1995) and would also be expected to reduce whooping crane mortality (Morkill and Anderson 1991). The marking of the overhead groundwire has been the focus of research because it appears to be the one most often struck by birds in flight (Scott et al. 1972, Willard et al. 1977, Brown et al. 1987, Faanes 1987). A review of the literature indicated that increasing the visibility of power lines by installing markers on the groundwires was the most cost-effective and logistically feasible potential method for reducing bird collisions (Beaulaurier 1981, Archibald 1987) and are the most common modification made by the electric power industry to reduce bird collisions (APLIC 1994). Except for part of the Brown and Drewien (1995) study, all other marking systems discussed below have been installed on the unenergized overhead groundwires (APLIC 1994).

Aerial marking spheres, spiral vibration dampers (SVD's), and Bird Flight Diverters (BFD's) have all been used to significantly reduce collisions (APLIC 1994). Total bird mortality was reduced 57-89% depending on spacing by BFD's placed on overhead groundwires in the Netherlands where it has become standard to mark lines in bird-collision zones (Koops 1987). Collisions were reduced by 53% for non-passerine species at a South Carolina transmission line outfitted with yellow marker balls (Savereno et al. 1996) and by 54% for lesser sandhill cranes in Nebraska using 1-5 spheres per span (Morkill and Anderson 1991). In southwestern Colorado, yellow SVD's installed to cover 27.5% of a span reduced collisions of cranes and waterfowl by 61%, while yellow fiberglass square plates reduced mortality to the same species by 63% (Brown and Drewien 1995). However, the aerodynamic instability of the swinging plates proved to be very damaging to the conductors (Miller 1990, Brown and Drewien 1995). Yellow plastic tubes placed on power lines near Hokaido, Japan reduced mortality and was a primary factor for the increase in the population of red-crowned cranes after 1976 (Archibald 1987).

Brown and Drewien (1995) suggested that color is an important factor in marker effectiveness; they selected yellow-colored SVD's in their study because SVD's were highly visible in poor light. Yellow has been shown to be useful in color-marking system studies because it reflects light longer on both ends of the day, and does not blend in with background colors as readily as international orange (APLIC 1994). Other potentially helpful devices to reduce strikes include bird flappers and diverters, such as the Firefly and BirdMark, which swivel in the wind, glow in the dark, and use fluorescent colors designed specifically for bird vision. More research is needed on such devices to test their effectiveness.

A limited study compared the use of an oversized overhead groundwire with a conventional overhead groundwire (Brown et al. 1987, Miller 1990). Researchers concluded that there were no significant effects on bird response (APLIC 1994). Removal of overhead groundwires can be an effective means of reducing bird collisions (Beaulaurier 1981, Brown et al. 1987). The development of polymer insulation and polymer lightning arrestors has introduced another option in the removal of overhead groundwires (APLIC 1994).

Manville (2005) provided an update on industry efforts to minimize avian collisions.

“In an attempt to comprehensively address the collision problem, APLIC (1994) provided voluntary guidance to the industry on avoiding power line strikes. The document will be updated once research being conducted by the Electric Power Research Institute and others at the Audubon NWR, North Dakota, is completed, and results of tests on a Bird Strike Indicator and Bird Activity Monitor can be published. Other research findings will also likely be included.”

Techniques currently recommended to reduce whooping crane strikes include marking lines to make them more visible in areas frequently used by cranes (Brown et al. 1987). USFWS recommends to avoid placing new line corridors near wetlands or other crane use areas, and usually recommends lines should be marked when crossing wetlands, or at a minimum distance within 0.4 km (0.25 mi) of a known crane roost or use area (W. Jobman, USFWS, Grand Island, Nebraska, pers. comm.). Brown et al. (1987) recommended locating new power lines at least 2.0 km (1.2 mi) from traditional roost and feeding sites based on their finding of no collisions observed when roosting and foraging sites were more than 1.6 km (1 mi) apart.

Additional Recommended Actions

The following actions recommended for species recovery are listed in the draft Canada-U.S. Whooping Crane Recovery Plan (CWS and USFWS 2005):

- Use telemetry and/or continue to document sightings with the whooping crane reporting network to better define areas receiving high crane use and locations where power lines are a significant problem.
- Monitor the placement and design of all new power lines in areas of known crane use. When possible, bury new power lines or route them around areas frequently used by whooping cranes.
- Mark existing problem lines to reduce collisions. Visibility should be maximized on any existing structures or those, which of necessity, must be constructed in whooping crane use areas or flight routes by following CWS and/or USFWS guidelines to reduce bird strikes.
- Remove unnecessary power lines from traditional stopover sites, Critical Habitat, National Wildlife Areas, National Wildlife Refuges and National Wetland Areas used by whooping cranes.
- The Whooping Crane Recovery Team should make contact with the Avian Power Line Interaction Committee (APLIC) to stay apprised of new developments in collision reduction and work jointly to ascertain and implement actions to reduce whooping crane mortality due to collisions with power lines.

With power line strikes the greatest source of mortality of fledged whooping cranes, a species still very endangered, it is important to try to reduce the current level of mortality. The USFWS, working in collaboration with representatives of the electric utility industry, desires over the next several years to perform the following tasks. The point of contact for USFWS will be its Whooping Crane Coordinator.

- Develop contacts with key members of APLIC and work together to agree upon the most effective actions needed to reduce whooping crane mortality. Create a Whooping Crane Strike Avoidance Team to more formally address this issue with industry and other stakeholders.
- Work with APLIC to better define criteria for which lines need to be marked. Create maps showing the main whooping crane migration corridor where lines may need to be marked. Define areas where lines do not need to be marked, such as highly developed urban areas or areas at the edges of the migration corridor.
- Spread information about power line strikes being the primary short-term threat to survival of fledged whooping cranes in migration. This manuscript should be refined and published at the 10th North American Crane Workshop in February, 2006. Send out information to USFWS Ecological Services offices, other agencies and industry representatives.
- Standardize USFWS policy carried out by Ecological Services offices within the whooping crane migration corridor to ensure an increased effort to recommend marking existing and new lines where needed.
- Work with the Ecological Services and Refuge divisions of USFWS to concentrate initially on getting lines marked within or near Critical Habitat, National Wildlife Refuges, and Wildlife Management Areas. Ensure that areas around traditional stopover sites are adequately marked.
- Monitor the placement and design of all new lines in the whooping crane migration corridor.
- Work to gain support to increase the overall percentage of marked lines in the whooping crane migration corridor to reduce mortality. Insure that this percentage continues to increase even as new lines are constructed.
- Encourage the electric utility industry and others to fund further research into reducing whooping crane strikes that would provide beneficial information for all diurnal species.
- Use information from this issue paper to help write and implement voluntary Avian Protection Plans for utilities in the migration corridor of the AWBP corridor. These plans would be utility-specific programs to reduce damage caused by avian interactions with electric utility facilities and reduce bird strikes. Guidelines for Avian Protection Plans are currently available on-line.

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
106 SOUTH 15TH STREET
OMAHA NE 68102-1618
July 27, 2007

REPLY TO
ATTENTION OF

Planning, Programs, and Project Management Division

Mr. Matt Marsh
Upper Great Plains Region
Western Area Power Administration
P.O. Box 35800
Billings, Montana 59107-5800

Dear Mr. Marsh:

The U.S. Army Corps of Engineers, Omaha District (Corps), has reviewed your letter dated July 5, 2007, regarding the Basin Electric Power Cooperatives proposed transmission line. The Corps offers the following comments:

If the proposed powerline construction crosses the flood plains of small drainageways and streams, flood-related problems should not occur if the supporting structures for overhead powerlines are located as far from the banks of the drainageways and streams as possible. This will minimize the potential for erosion hazards and floodflow obstruction. Similarly, flood-related problems should not occur with underground power lines, if the lines are buried far enough below the beds of drainageways and streams to prevent exposure due to streambed erosion during periods of high floodflows. If any aboveground construction is subject to flood damage, such as electrical boxes, they should either be placed above, or flood proofed to, a level above the 100-year flood elevation.

Your plans should be coordinated with the U.S. Environmental Protection Agency, which is currently involved in a program to protect groundwater resources. If you have not already done so, it is recommended you consult with the U.S. Fish and Wildlife Service and the South Dakota Game, Fish and Parks Department regarding fish and wildlife resources. In addition, the South Dakota State Historic Preservation Office should be contacted for information and recommendations on potential cultural resources in the project area.

If construction activities involve any work in waters of the United States, a Section 404 permit may be required. For a detailed review of permit requirements, preliminary and final project plans should be sent to:

U.S. Army Corps of Engineers
Pierre Regulatory Office
Attention: CENWO-OD-R-SD/Naylor
28563 Powerhouse Road, Room 120
Pierre, South Dakota 57501

If you have any questions, please contact Ms. Kristine Nemecek at (402) 221-4628.

Sincerely,

Larry D. Janis, Chief
Environmental, Economics, and
Cultural Resources Section
Planning Branch

121-1

United States Department of Agriculture



Natural Resources Conservation Service
P.O. Box 1458
Bismarck, ND 58502-1458

July 26, 2007

Nicholas Stas
DOE – Western Area Power Administration
Upper Great Plains Region
PO Box 35800
Billings, MT 59107-5800

RE: Belfield – Rhame 230 kV Transmission Line Project – Bowman, Hettinger, Slope, and Stark Counties, ND

Dear Mr. Stas:

The Natural Resources Conservation Service (NRCS) has reviewed your letter regarding the referenced activity. NRCS has a major responsibility with the Farmland Protection Policy Act (FPPA) in documenting conversion of farmland (i.e., prime, statewide, and local importance) to non-agricultural use. FPPA is not affected by “Finding of No Significant Impact” but is driven by the use of Federal funding for a project. Your letter does not indicate a funding source; assuming your project is not federally funded, FPPA will not apply. At this time, NRCS has no comment on your project.

If you have additional questions pertaining to FPPA, please contact Steve Sieler, State Soil Liaison, at (701) 530-2019.

Sincerely,

A handwritten signature in black ink that reads "J.R. Flores".

J.R. FLORES
State Conservationist

cc:

Mike Sondeland, DC, NRCS, Bowman, ND
Darrin Olin, DC, NRCS, Mott, ND
Todd Solem, DC, NRCS, Dickinson, ND
Terry Gisvold, ASTC (FO), NRCS, Dickinson, ND

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NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov



July 23, 2007

Matt Marsh, Environmental Protection Specialist
Upper Great Plains Region
Western Area Power Administration
P.O. Box 35800
Billings, MT 59107-5800

Re: Belfield-Rhame 230-kV Transmission Line Project
Bowman, Hettinger, Slope and Stark Counties, ND

Dear Mr. Marsh:

This department has reviewed the information concerning the above-referenced project under date of July 5, 2007, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. All necessary measures must be taken to minimize fugitive dust emissions created during construction activities. Any complaints that may arise are to be dealt with in an efficient and effective manner.
2. Noise from construction activities may have adverse effects on persons who live near the construction area. Noise levels can be minimized by ensuring that construction equipment is equipped with a recommended muffler in good working order. Noise effects can also be minimized by ensuring that construction activities are not conducted during early morning or late evening hours.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

L. David Glatt, P.E., Chief
Environmental Health Section

LDG:cc

Environmental Health
Section Chief's Office
701.328.5150

Division of
Air Quality
701.328.5188

Division of
Municipal Facilities
701.328.5211

Division of
Waste Management
701.328.5166

Division of
Water Quality
701.328.5210

22-10



U.S. Department
of Transportation
**Federal Aviation
Administration**

Federal Aviation Administration
Bismarck Airports District Office
2301 University Drive, Building 23B
Bismarck, North Dakota 58504

August 6, 2007

Mr. Matt Marsh, Environmental Protection Specialist
Upper Great Plains Region
Western Area Power Administration
PO Box 35800
Billings, MT 59107-5800

Dear Mr. Marsh:

Re: Belfield-Rhame 230kV Transmission Line Project
Bowman, Hettinger, Slope, and Stark Counties
Belfield to Rhame, North Dakota

The Bowman County Airport Board is Sponsor of proposed construction improvements for the existing Bowman Municipal Airport and has authorized Brosz Engineering (and it's subcontractor Ulteig Engineers) of Bowman, North Dakota, to prepare environmental documentation needed for our review of the proposed actions. Federal funds are being provided to conduct an environmental assessment on possible airport enhancements to meet the airports aeronautical needs. A new county airport site is one consideration being evaluated under this process.

The Bowman County Airport Board is currently studying three locations near Bowman for the airport relocation. The Bowman Municipal Airport Environmental Assessment location maps are enclosed (4 pages). One of the proposed locations for the Bowman Municipal Airport, Study Area B, is in/near the proposed location of the Belfield-Rhame 230kV transmission line project.

The Bismarck Airports District Office would like to be included in the project mailing list and the review of potential transmission line impacts to the potential airport relocation sites.

If not already included in your planning process, we request that the Bowman County Airport Board and the North Dakota Aeronautics Commission be given the opportunity to provide input and comments on the Bowman-Rhame 230kV Transmission Line Environmental Assessment.

If not already included in your planning process, we request you contact FAA technical operations to identify any possible impacts to aircraft navigation and/or communication

561

equipment in the proposed transmission study area. The Minneapolis Technical Support Center (MSP TSCM) for the proposed area may be contacted by phone at (952) 997-9261 or in writing. The address for the MSP TSCM is:

Federal Aviation Administration
Minneapolis Technical Support Center
Attn: MSP TSCM
14800 Galaxie Ave, Suite 300
Apple Valley, MN 55124

The proponent shall ensure the design, construction, and operation of the transmission line and any required wetland and/or wildlife habitat mitigation does not create a hazardous wildlife attractant to surrounding airports. Hazardous wildlife and hazardous wildlife separation distances are defined in FAA Advisory Circular (AC) 150/5200-33A, Hazardous Wildlife Attractants on or near airports. All design, construction, and operation of the transmission line and its components (such as materials handling, landscaping, ditches, and storm water management) shall comply with FAA AC 150/5200-33A, Hazardous Wildlife Attractants on or near Airports. A copy of the advisory circular may be obtained at www.faa.gov.

Please be advised FAA Advisory Circular 150/5200-33A, Hazardous Wildlife Attractants On or Near Airports, advises a 10,000 foot separation distance between certain airports and a hazardous wildlife attractant. Additionally, it is recommended that a 5-mile separation distance be considered when the attractant could cause wildlife movement into or across the approach or departure airspace.

If you or the proponents are uncertain if the proposed development will cause a wildlife hazard for your airport or other airports in the area, we recommend you or the proponent consult with the United States Department of Agriculture, APHIS, Wildlife Services or an other qualified wildlife biologists. We recommend any wildlife biologist consulting on a matter such as this, meet the qualifications identified FAA Advisory Circular 150/5200-36, "Qualifications for wildlife biologist conducting wildlife hazard assessments and training curriculums for airport personnel involved in controlling wildlife hazards on airports".

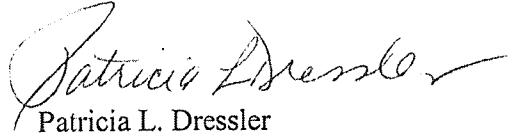
Also, the proponent of the transmission line shall notify the Federal Aviation Administration (FAA) of construction or alterations as required by Federal Aviation Regulations, Part 77, Objects Affecting Navigable Airspace, Paragraph 77.13. Please note that Part 77 includes temporary construction vehicles and equipment. The Notice of Proposed Construction or Alteration Form 7460-1 may be obtained and filed online at <https://oeaaa.faa.gov> or mailed to:

Express Processing Center
FAA Southwest Regional Office
Obstruction Evaluation Service, AJR-32
2601 Meacham Boulevard
Fort Worth, TX 76137-0520

I appreciate that our office was given the opportunity to review this project. Please contact me if you have any questions or need further information.

If you have additional questions, please contact our office at (701) 323-7380.

Sincerely,

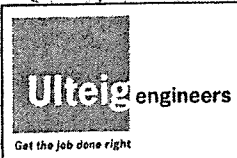
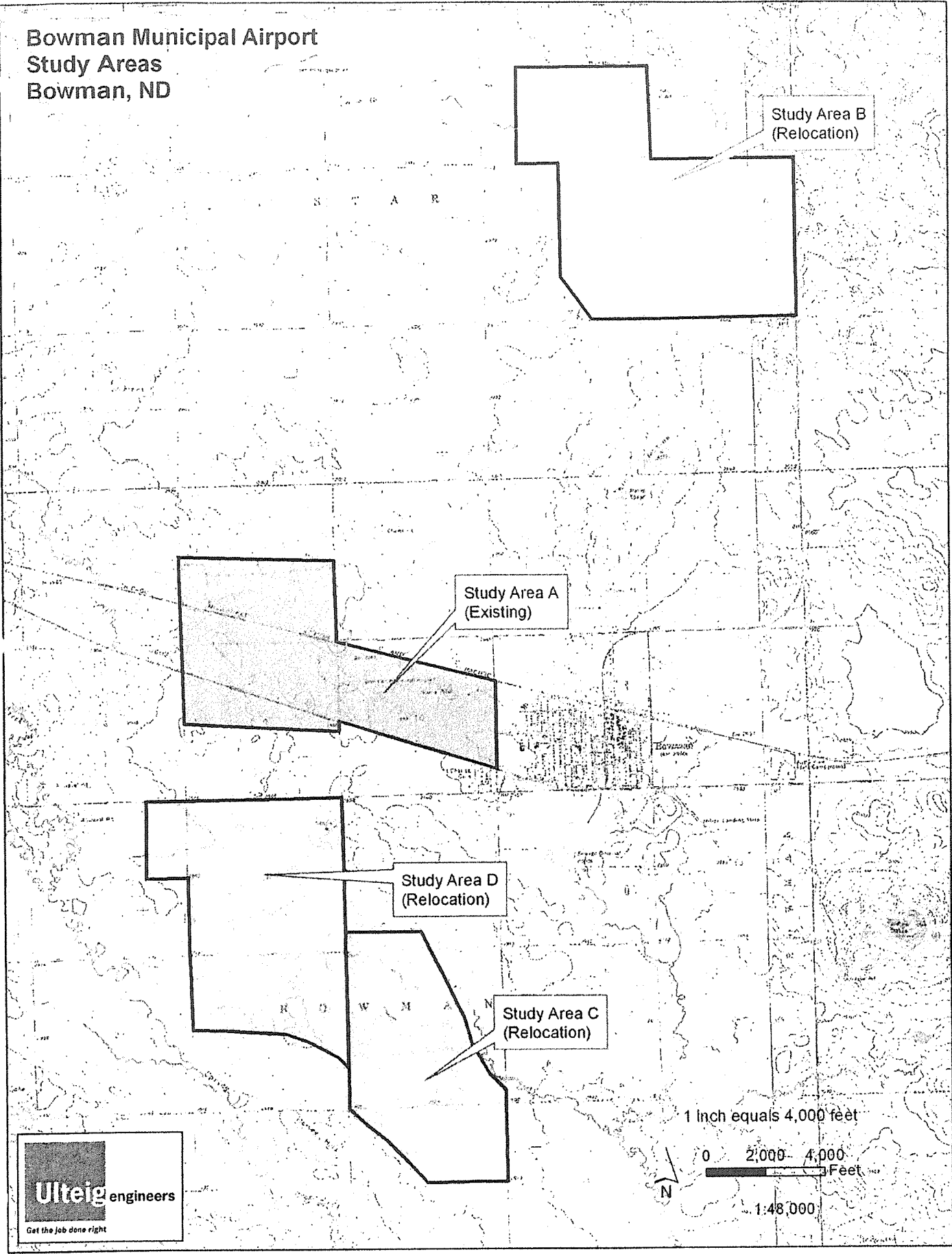


Patricia L. Dressler
Environmental Protection Specialist
Bismarck Airports District Office

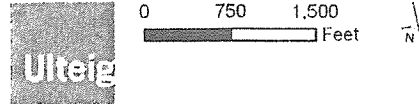
Enclosure

cc w/o enclosure:
Bowman County Airport Board
North Dakota Aeronautics Commission




**Bowman Municipal Airport
Study Areas
Bowman, ND**

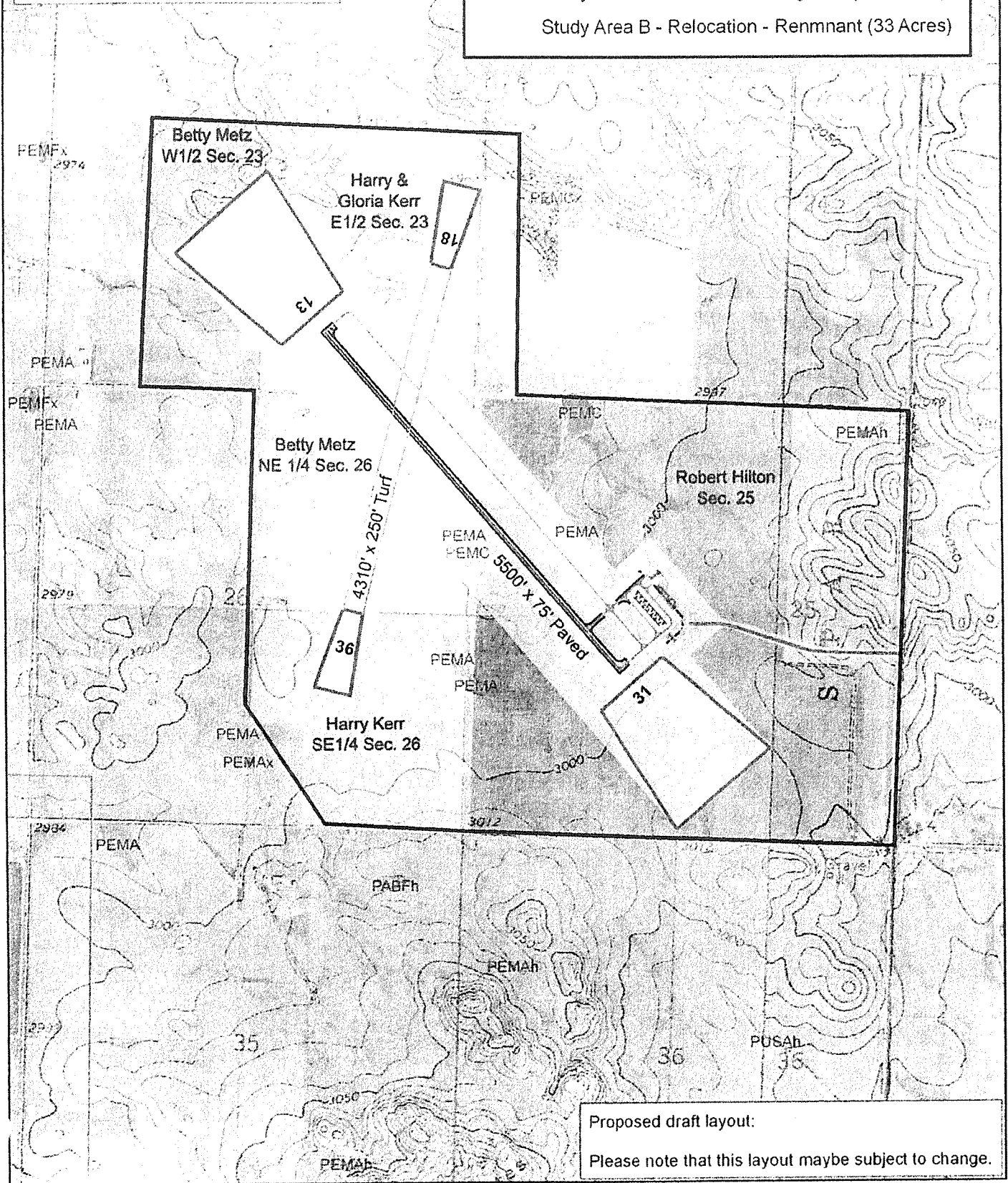


Study Area B



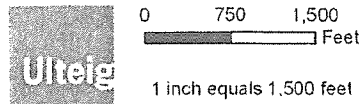
Legend

-  Study Area B
-  Study Area B -Relocation - Avigation (403 Acres)
-  Study Area B - Relocation - Remnant (33 Acres)



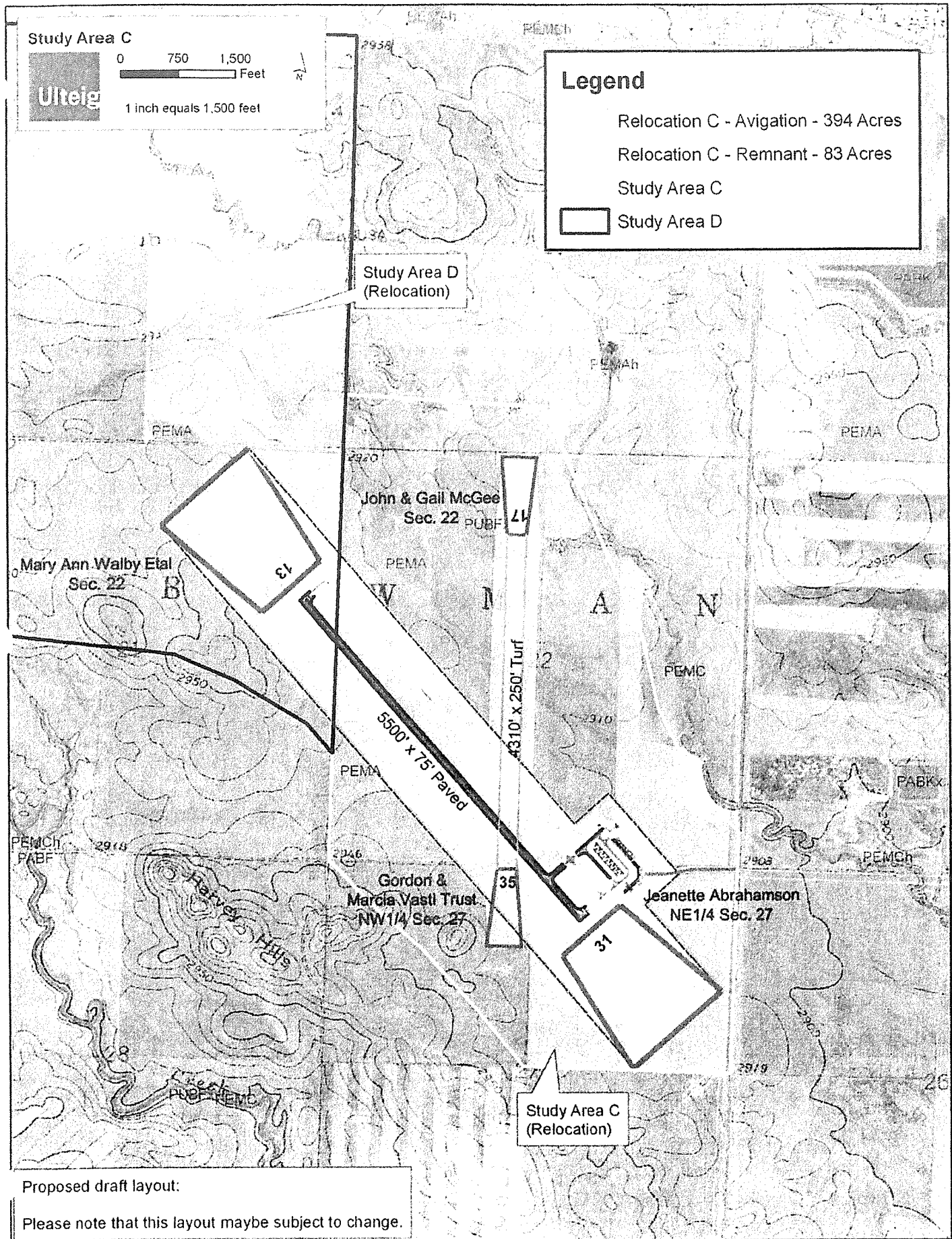
Proposed draft layout:
Please note that this layout maybe subject to change.

Study Area C



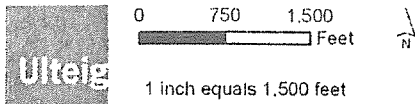
Legend

- Relocation C - Avigation - 394 Acres
- Relocation C - Remnant - 83 Acres
- Study Area C
- Study Area D



Proposed draft layout:
Please note that this layout maybe subject to change.

Relocation D



Legend

Relocation D - Avigation (401 Acres)

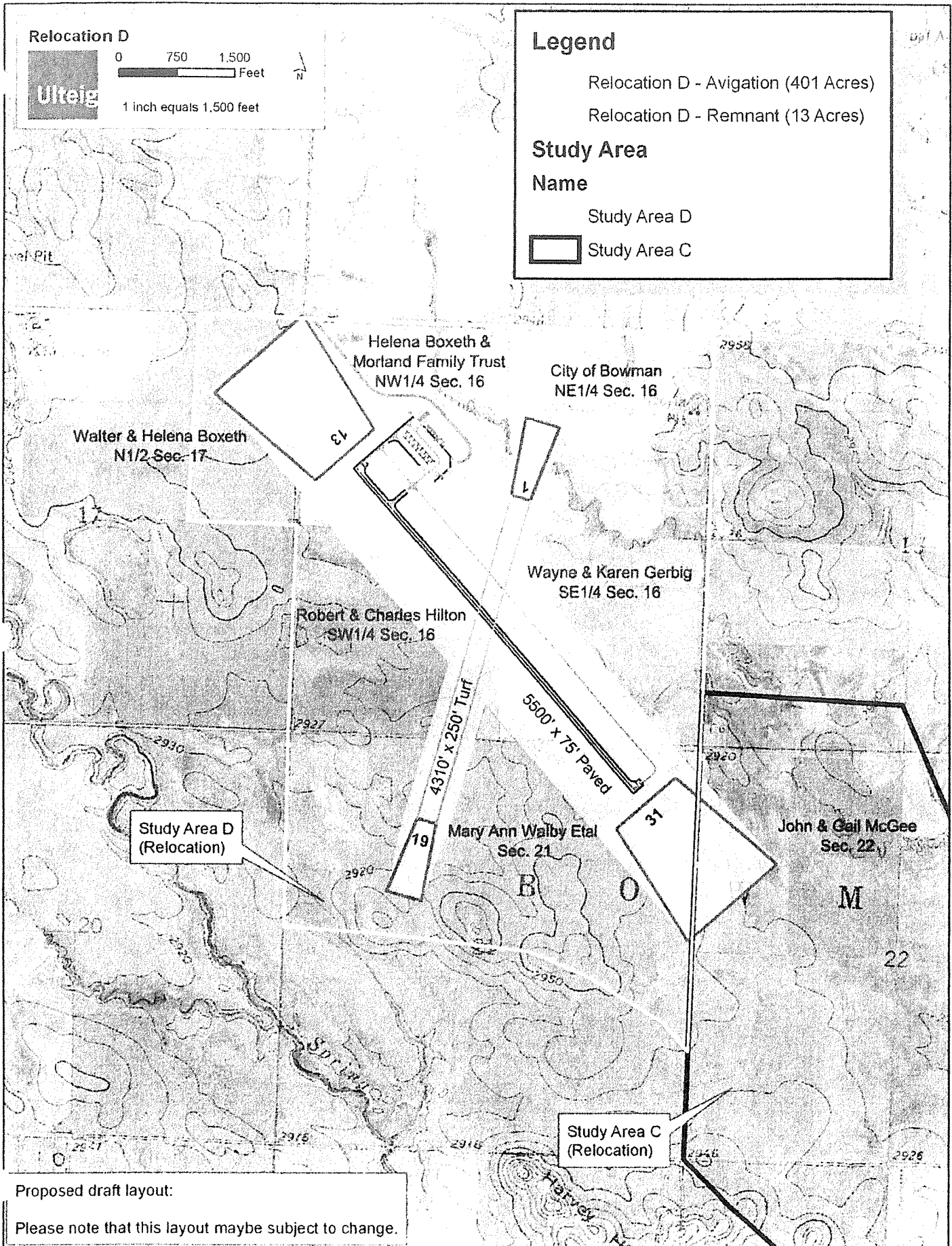
Relocation D - Remnant (13 Acres)

Study Area

Name

Study Area D

Study Area C



NORTHERN CHEYENNE TRIBE
TRIBAL HISTORICAL PRESERVATION OFFICE
 P.O. Box 128
 Lame Deer, Montana 59043
 (406) 477-6035 Fax(406)477-6210
Native American Consultation Response Form

From: Northern Cheyenne Tribal Historical Preservation Office (Conrad Fisher)

Re: Consultation

Site Name:	Basin Electric Power Cooperative
TCNS Notification ID Number:	
TCNS Filing/Notification Date:	
Site Address:	Bellevue N.D

Response:


- We have no comments related to proposed project.
- Will have no effect on tribal religious or sacred sites.
- May affect tribal religious or sacred site; please notify if cultural resources are found during site investigation/construction.
- Other (please specify) _____

Exception: If archaeological materials or human remains are encountered during construction, the State Historic Preservation Office and applicable Native American Tribes will be notified.



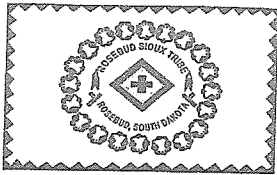
 Signature

Mr. Conrad Fisher, Director N.C.T./THPO
 Printed Name



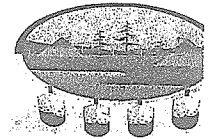
 Date

1(406)477-6035
 Telephone No.



Preserving the Land, Cultural
Heritage, Tradition for the
Future Generation

Rosebud Sioux Tribe
Tribal Historic Preservation Office
P.O. Box 809
Rosebud, South Dakota
Telephone: (605) 747-4255
Fax: (605) 747-4211
Email: rstthpo@yahoo.com



Russell Eagle Bear
Officer

Kathy Arcoren
Administrative Assistant

August 8, 2007

Department of Energy
Western Area Power Administration
Upper Great Plains Region
PO Box 35800
Billings, Mont. 59107-5800
Atten: Steve Tromly

Re: Transmission line from Belfield and Rhame


Dear Mr. Tromly,

We are responding to your letter dated July 09, 2007 in reference to the request from Basin Electric to interconnect a proposed transmission line with the Western's transmission system in the State of North Dakota, from Belfield Substation east of Belfield to a new substation to be built south of Rhame.

As the Tribal Historic Preservation Officer for the Rosebud Sioux Tribe I appreciate your notification of the undertaking and the awareness you are demonstrating for the archaeological sites and cultural heritage of Indigenous peoples.

Please forward the Environmental Assessment for this proposed project. At this time we have no concerns for this project to proceed as planned; we will make our comments once we receive the EA and have time to review the document.

Thank you for your time and consideration of this letter.

Sincerely,

Kathy Arcoren
In: Mr. Russell Eagle Bear



Correspondence Summary Sheet

By: Patti Lorenz Date: 10/01/07

Talked With: Andrea Bowman Project Number: 10735-006-800

Title: Extension Agent Project Name: Basin Electric – Belfield to Rhame
Transmission Line

Of: Bowman County Extension Office Subject: Noxious Weeds

Telephone Number: (701) 523-5271 Facsimile Number:

Email or Internet Address (if applicable): NA

Supplemental Information Attached? YES NO

Indicate Documentation Type: Telephone Facsimile Internet Email

Andrea listed Baby's breath (*Gypsophila paniculata*) as a noxious weed specific to Bowman County in addition to the state list.

FILE NAME- PL_AB_BCEO_100107.doc

Patricia M. Lorenz

Signature

Distribution: (1) File (2) Self (3) Report



Correspondence Summary Sheet

By: Patti Lorenz **Date:** 10/01/07
Talked With: Secretary **Project Number:** 10735-006-800
Title: Weed Board **Project Name:** Basin Electric – Belfield to Rhame
Transmission Line
Of: Stark County Extension Office **Subject:** Noxious Weeds
Telephone Number: (701) 456-7665 **Facsimile Number:**
Email or Internet Address (if applicable): NA
Supplemental Information Attached? YES NO
Indicate Documentation Type: Telephone Facsimile Internet Email

The secretary of the Stark County Extension Office listed noxious weeds specific to Stark County. These noxious weeds are in addition to the state list. They include:

- Hoary cress (*Cardaria draba*);
- Yellow toadflax (*Linaria vulgaris*); and
- Black henbane (*Hyoscyamus niger*).

FILE NAME- PL_SCEO_100107.doc

Patricia M. Lorenz

Signature

Distribution: (1) File (2) Self (3) Report



Correspondence Summary Sheet

By: Patti Lorenz **Date:** 10/16/07
Talked With: Joan Lorge **Project Number:** 10735-006-800
Title: Weed Officer **Project Name:** Basin Electric – Belfield to Rhome
Transmission Line
Of: Slope County Extension Office **Subject:** Noxious Weeds
Telephone Number: (701) 879-6316 **Facsimile Number:**
Email or Internet Address (if applicable): NA
Supplemental Information Attached? YES NO
Indicate Documentation Type: Telephone Facsimile Internet Email

Joan Lorge of the Slope County Extension Office listed noxious weeds specific to Slope County. These noxious weeds are in addition to the state list. They include:

- St. Johnswort (*Hypericum* sp.); and
- Hound’s tongue (*Cynoglossum* sp.).

FILE NAME- PL_SCEO_101607.doc

Patricia M. Lorenz

Signature

Distribution: (1) File (2) Self (3) Report

Appendix D

Public Comments and Transmission Line Routing

SUMMARY LIST OF KEY PUBLIC COMMENTS

Agricultural Impacts

- Preference stated that the transmission line route be located ½ mile south of White Lake where there is less impact to cropland.
- Consider impacts to potential housing, existing tree rows, and feedlot operations in T132N R102W Section 16.
- Address overall impacts to farming during construction following completion.
- Since the proposed project is not federally funded and the Farmland Protection Policy Act does not apply, the NRCS does not have any comment on the proposed project.
- Prefers that the proposed route follow section lines to avoid impacts to farming activities in T133N R100W Section 5.
- Evaluate transmission line interference with moving cattle to feed and calf-out in T132N R102W Section 15.
- Consider the potential of the proposed project interfering with wide farm equipment.
- Prefers the transmission line be routed in pastureland to avoid impacts to farming activities.
- Segment 150 of the proposed transmission line could impact farming operations in T137N R98W Section 33, west ½ of Section 34, and N ½ of Section 6.

Routing Alternatives

- Numerous comments indicated that landowners preferred transmission line alignments to be located along section lines.
- Some landowners preferred alignments that would be off-set approximately 130 feet into their property from the fence line. The 130-foot inset would allow movement of large equipment between the fence line and the transmission line structures
- Some landowners preferred the transmission line be routed along the mid-section and quarter-section.
- A landowner indicated that a coal mining interest has paid options on a 160-acre parcel in the NE quarter of Section 29 of T139N R98W. The parcel would be on the western edge of proposed mining operations. The area would preclude construction along the east side of Section 29.
- A landowner indicated that large farming operations dominate Sections 6, 7, and 18 of T136N R98W and Section 34 of T137N R98W and was opposed to routing the transmission line across these sections.
- Consider transmission line routing to avoid a house that does not show up on aerial photography located in the SW quarter of the NW quarter of Section 32 of T139N R98W.
- Suggestion made to route the proposed transmission line through federal lands to avoid disruption to private lands.

- Landowner concern about conflicts with land use agreement signed with a potential coal mining company for the NE ¼ of Section 29 T139N R98W.
- Avoid proposed transmission line segments 190 and 210 – proposes to cross along the north side of Section 1, 2, 3 T134N R100W.
- Supports Segment 220 – the alignment would run 11 to 12 miles north/south of Section 28 T132N R102W.
- Concern that the proposed line would cut through the mid-section making it difficult for maneuvering farm equipment – NE ¼ E1/2 SE1/4 Section 16 T132N R102W.
- Recommends contacting the FAA technical operations to insure no impacts to aircraft navigation and/or communication equipment in the proposed transmission line study area (see letter to contact information).
- Consider the potential impacts to the proposed location of the Bowman Municipal Airport and the proximity of the proposed project.
- Suggests Segment 340 and 330 be considered as alternative routes to avoid farmsteads and tilled fields.
- Concern about the proposed transmission line route in T134N R100W SW 1/3 of Section 14 (Segment 210) – suggests 200.
- Suggests working with Senators and Representatives to get permission to cross federal lands.
- Prefers the transmission line be routed in pastureland to avoid impacts to farming activities.
- Consider transmission line Segment 140 and 160 because it crosses more pastureland and would minimize impacts to farmlands.

Biology Resources

- The project area is located on the western edge of known whooping crane migratory route. Consider the potential for whooping crane collision with power lines.
- Recommends “Mitigating Bird Collisions with Power Lines: The State of the Art in 1994” and “Suggested Practices for Avian Protection on Power Lines to increase the visibility of the transmission line and reduce bird collisions.
- Avoid wildlife nesting seasons by scheduling construction in the late summer or fall.
- Design, construction, and operation of the transmission line and its components should comply with FAA AC 140/5200-33A, Hazardous Wildlife Attractants on or near airports.
- A 5-mile separation distance is recommended when the attractant could cause movement of wildlife into or across the approach and departure airspace.
- A 10,000-foot separation distance is required between certain airports and a hazardous wildlife attractant.
- Design, construction, operation, and wetland mitigation activities should not create a hazardous wildlife attraction to the surrounding airports.

Construction Process

- The Little Badlands are considered to have highly erodible soils. Evaluate the potential for impacts with regard to access and construction difficulties.
- Construction should be scheduled to avoid damage to crops.
- During construction, all necessary measures should be taken to minimize fugitive dust emission.
- Powerlines should be constructed away from small drainages and streams in flood-prone areas.

Cultural Resources

- A landowner identified an area known as "Custer Hill" (T139N R98W) is of local interest and should be considered in the environmental analysis.
- The Northern Cheyenne Tribe, Tribal Historical Preservation Office had no comments related to the proposed project, but requested they be notified if cultural resources are found during site investigations and construction.
- The Rosebud Sioux Tribe commented that they had no concerns about the proposed project as planned and requested a copy of the EA.

Geology/Minerals/Soils

- Potential impacts to scoria resources within Section 16 T132N R102W should be evaluated in the environmental analysis.
- Soils are highly erodible in T137N R98W; evaluate the potential of increased soil erosion resulting from construction of the proposed transmission line.

Land Use

- Landowners indicated that a transmission line across the property would interfere with future property development, agricultural practices, and could devalue the land.
- Concern about impacts to potential housing, existing tree rows, and feedlot operations in Sec 16 R132N T102W.
- Consider the potential for impacts to two 20-acre coverlocks with the North Dakota Fish and Game; one on the north ends of NE ¼ Section 29 T139N R98W; the other in the center of the SW ¼ of Section 29.
- Conflicts with land use agreement signed with a potential coal mining company for the NE1/4 of Section 29 T139N R98W.
- Question about whether the landowner would be responsible for the taxes within the right-of-way.
- Question about whether the transmission line could be routed through the National Grasslands areas.

- Question regarding compensation for land damaged as a result of transmission line construction on their land.
- Concern about project's impacts to residences.

Noise

- Construction equipment should be equipped with a recommended muffler in good working order to minimize adverse noise effects to people living in close proximity.

Public Health and Safety

- Evaluate the potential dangers of working around the proposed transmission line.
- Analyze whether the proposed project will have an effect on TV reception, cell phone reception, and personal health.
- Concern about impacts to health and safety from construction of the proposed transmission line.

Project Purpose and Need

- Landowners expressed concern that they were paying for the transmission line to be constructed so that the oil companies could make a profit.
- Question about whether the power would stay in southwestern North Dakota or would the power serve other states?
- Question about why the need for the proposed transmission lines and what is the growth creating the demand?

Recreation

- Evaluate the potential impacts to game bird hunting with construction of transmission lines that severs a block of land.

Socioeconomics

- Analyze project effects on the value of farm lands.

Soils

- The appropriate erosion control measures should be installed and maintained during construction to reduce sediment transport.

Vegetation

- Following construction, disturbed areas should be re-seeded with a mixture of native grass and forb species.
- Trees/shrubs removed during construction should be replaced at a ratio of 2 to every one removed.

Visual Resources

- Suggests avoiding a transmission route alignment near White Butte that could potentially result in visual impacts.
- Avoid transmission line routing near residences to reduce visual impacts.

Water Resources

- Consider potential impacts to spring where the proposed transmission line crosses T137N R98W, Sections 21 and 28.
- The U.S. Army Corps of Engineers should be contacted if construction of transmission lines intersect wetlands, streams, or rivers.
- Transmission line construction should not alter stream channels or drainages.
- Avoid placement of structures in wetlands or stream channels. Structures should be located as far from the banks of drainage ways and streams as possible.
- Contact the U.S. Army Corps of Engineers should transmission line construction involve work in waters of the U.S.
- Recommends that the Environmental Protection Agency be contacted regarding any potential impacts to groundwater.
- All aboveground construction, such as electrical boxes, should be placed above the level of a 100-year flood elevation.
- Transmission line construction should avoid small drainages and streams in flood-prone areas.
- Design, construction, operation, and wetland/wildlife mitigation activities should not create a hazardous wildlife attraction to the surrounding airports.

Appendix D Refined Routing Comments (see exhibit D-1 for Route Segments)

Belfield-Rhame 230-kV Transmission Line Route Selection and Analysis Summary				
No.	Township	Range	Section	Routing Rationale/Discussion
1	139	98	20	SE1/4 has existing coal mine lease for construction of operations area. Line was routed in SW1/4.
2			29	Maintaining straight alignment. South end of section has houses on each corner. On east side, house is in NW1/4 of Section 32.
3			32	Maintaining straight alignment and adequate distance from house in NE1/4. Route diagonal to SE corner of Section 5, Township 138, Range 98 to avoid house in Section 8, Township 138, Range 98.
4	138	98	5	Maintaining straight line diagonal.
5			8	Maintaining straight line along East section line, avoiding house in middle of section.
6			17	The line shifted to the quarter line here to avoid the rough terrain in the Little Badlands, avoid two eagles' nests, and accommodate a landowner preference further south.
7			20, 29, 32	Continue straight south along 1/4 line. Farmers have indicated they prefer the line be on the 1/4 line, not the section line. Private landowners are in agreement with this alignment. These landowners are further south, but the eagles' nests and these preferences justify placing the line on the 1/4 line.
8	137	98	5	Private landowner owns entire section. He prefers the line be angled over to East to stay on pasture land and to accommodate Myron Eberts in Section 8.
9			8	Private landowner requested the line be moved over to the property line, 1/4-mile east. Line was moved 1/4 mile east.
10			17	Angle across section to get back to 1/4 line.
11			20	Different ownership in each 1/4 section. Private landowners prefer line there. Structure poles will be into each field only 10 feet.
12			29	Continue along 1/4 line. Line will be along edges of adjacent fields. Also, private landowner preferred line at this location (line is west of her parent's original farmstead and family homestead.) Line turns and goes along south edge of section.
13			28, 33, 34	Line will be along section line, then follow creek bed across section. Structures will be placed in areas that are not farmed, if possible. Line turns south and follows creek bed to 1/4 line at north edge of Section 6.

Appendix D Refined Routing Comments (see exhibit D-1 for Route Segments)

Belfield-Rhame 230-kV Transmission Line Route Selection and Analysis Summary				
No.	Township	Range	Section	Routing Rationale/Discussion
14	136	98	6, 7, 18, 19	Line follows 1/4 line. Private landowners prefer this route. Line is kept 0.5 mile away from National Grasslands. Also, line is kept 0.5 mile from private landowner's house in Section 20. If line was taken 0.5 mile to east to section line, it would have to go back west before private landowner's place, resulting in 1 mile extra line.
15			30	Line is angled over to section line along creek bed to stay away from the private landowners' residences.
16			31	Line continues along section line.
17	135	98	6, 5	Line angles to east to go around private landowner's old farmstead. No house on this farmstead. Line then angles back into Section 6 at south end.
18			7	Line follows section line down to 1/4 line, then turns west. Line is along 1/4 line to avoid nice grove of pine trees, private landowner residence (Section 6), and another private landowner residence (Section 1).
19		99	12	Line continues along quarter line to minimize impact on crop fields.
20			11	Extensive crop land to south and east. Also White Lake Wildlife Refuge to west, so line is taken diagonally to SW to get on section line to minimize crop land impact. Land use in this section is pasture.
21	135	99	14	Crop fields on both sides of section line. Line is parallel to section line.
22			23, 26, 35	This area is crop land primarily. Line is kept on east side of section line because an area in Section 23 is pasture. West side of section line is all crop land.
23	134	99	2, 3	Pasture and hay land allow for a diagonal section to go SW. A house is avoided (private landowner) in Section 2. Line now needs to go south and west.
24			4, 5, 6	Line stays parallel to section line. Land use is primarily hay on north side of section line.
25	134	100	1	Line turns south here. Investigated going further west before turning, but would be close to farmsteads.
26			12	Continue south along section line. Staying on west side to take advantage of pasture land in Section 13.
27			13, 24	Diagonal to SW. Avoiding stock-watering pond in Section 13. Also avoid going into field that extends across the section line between 19 and 34 (private landowner's request).

Appendix D Refined Routing Comments (see exhibit D-1 for Route Segments)

Belfield-Rhame 230-kV Transmission Line Route Selection and Analysis Summary				
No.	Township	Range	Section	Routing Rationale/Discussion
28			26, 35	Running south parallel to section line, staying on pasture and hay land. In this area, the line was routed around a private landowner residence in Section 30 and a gravel pit in Section 25.
29	133	100	2	Pasture in the north 1/2 of section is crossed diagonally.
30			3, 10	Crop land on both sides of section line. Staying on west side to take advantage of pasture in Section 15.
31			15	Line diagonals across pasture.
32	133	100	21, 28	Line runs parallel to section line on west side to stay on pasture land for most of this segment.
33			33	In SE1/4, line diagonals on pasture land to SW. This is the start of a long diagonal on pasture land.
34	132	101	1, 12, 13	The line is approaching an area with seven farmsteads. Numerous options were considered in and all landowners were consulted. In these three sections, the line diagonals across pasture land in SW direction.
35			14	Line goes across pasture land along a creek bed, avoiding adjacent farm land.
36			15	Line runs diagonal on pasture land along creek bed. Crop land in SE1/4 will be avoided. Line is approximately 1,000 feet from farmstead. This farmstead is rented out. Options to pass through this area are limited.
37			16	Line runs parallel and adjacent to south section line on pasture land. Line is about 0.5 mile north of private landowner residence.
38	132	101	20, 19	Line runs diagonal on CRP and pasture land. Line crosses Highway 85, 1 mile north and 1 mile south of two private residences.
39	132	102	24, 23	Line parallels south section lines, staying on north side to avoid continuous crop land on south side. Line passes through an abandoned farmstead in SW1/4. Line avoids farmsteads to north and south.
40	132	102	27, 28	Line diagonals across pasture and hay land to SW. Farmstead in NE1/4 of Section 28 is avoided.
41			29	Diagonal route crosses SE1/4 on pasture land.
42			32	Line enters section on north edge just to west of steep scoria outcrop. Route turns to west along north edge and parallel to section line. Land use is pasture.
43			31	At request of landowner, line runs parallel to section lines on north and west sides.

Appendix D Refined Routing Comments (see exhibit D-1 for Route Segments)

Belfield-Rhame 230-kV Transmission Line Route Selection and Analysis Summary				
No.	Township	Range	Section	Routing Rationale/Discussion
44	131	102	6	Highway 12 and railroad crossings. This location was selected because of terrain and both are close together and parallel. Line crosses Section 6 in small grass area in NW1/4, avoiding crop land.
45	131	103	1, 2	At request of landowners, line runs along 1/4 line east to west. In Section 2, line turns south and runs adjacent to section line in SW1/4. At SW corner, line turns west.
46			3, 4	The new Rhame Substation site is nearly due east of this location. So, the line was routed in a straight line, following the section line. This section line was selected to avoid residences one mile north and one mile south would not provide good access to the substation site.
47	131	103	5, 6	Line continues along south section line.
48	131	104	1, 2	Line continues along south section line. In Section 2, line turns south at 1/4 corner. Line must turn here to avoid rough terrain and winding highway.
49			11	Line runs along 1/4 line, which minimizes impact on crop land.
50			14	Line runs along 1/4 lines, turning west in middle of section. Line crosses highway at 1/4 corner.
51			15	Line enters section at 1/4 corner, turns and terminates at new substation.

The following paragraphs describe in detail how the routing criteria were applied to each segment of the proposed route.

Belfield Substation to 48th Street SW Segment

This segment starts at the Belfield Substation. For reliability purposes, transmission operating regulations do not allow transmission lines to parallel each other; therefore, the proposed route can not go directly east or west because of existing transmission lines. Directly southeast of the Belfield Substation, land is currently under lease for a proposed coal mine to be developed by South Heart Coal, LLC. The proposed route proceeds south along the mid-section line for two miles and avoids houses on both corners of the section and a wooded creek bottom.

For the next 5 miles, the proposed route predominantly traverses grassland. Within this area, alignment adjustments were made to avoid a farmstead and golden eagle nests. The proposed route crosses the fringe of the Little Badlands area to avoid soils that are prone to erosion and to facilitate maintenance access. The remainder of this segment follows the mid-section line because of landowner preference.

48th Street SW to State Route 21 Segment

At the beginning of this segment, the proposed route angles to the east across 1 mile of grassland and along a property line in response to two landowners' requests. The next 3 miles of the proposed route

traverse cropland. To minimize impact to the cropland, the proposed route is angled back to the mid-section line at the request of area landowners. From this point, the proposed route turns east then southeast to avoid the Little Missouri National Grasslands boundary and follow a creek bed. This location was selected to minimize the impact to their farming operation as requested by the landowner's tenant. The proposed route then follows the mid-section line across cropland for 4 miles. Generally, the landowners in this area prefer the proposed route to follow the mid-section line in the middle of each section.

The proposed route then turns east to the section line to avoid passing in front of a farmstead, as requested by landowners in the area. The alignment crosses the section line to the east to avoid steep terrain. This segment ends at the crossing of State Route 21, approximately 7 miles east of New England.

State Route 21 to Slope/Bowman County Line Segment

This segment begins by crossing State Route 21 and extending to the mid-section line before turning west, which avoided a mature row of evergreen trees. The next 3 miles predominantly traverses grassland, which was the preferred alignment requested by the landowners. From this point, the proposed route turns south along the section line for 4 miles. Once reaching this point, the proposed route turns to avoid more rugged terrain and the White Lake National Wildlife Refuge to the west. The land use in this area is cropland. The proposed route crosses grassland on the eastern side of the section line and avoids cropland on the western side of the section line. From this point, the proposed route turns to the west to avoid a farmstead and traverses west along the section line for 4 miles across hay fields.

The proposed route turns southwest to avoid farmsteads to the west and diagonally crosses 2 miles of grassland and avoids a stock-watering dam. Also, this diagonal portion allows a large field of cropland to be avoided at the request of a landowner. The remainder of this segment traverses land in a southerly direction to the Slope County line. A gravel pit and a planned new residence were avoided by two diagonal alignment adjustments across grassland.

Slope/Bowman County Line to U.S. Highway 12 Segment

This segment begins in Bowman County with the proposed route continuing in a southwesterly direction across grassland and approaches an area with seven farmsteads, which were avoided as requested by several landowners. From this point, the proposed route follows the mid-section line across cropland and grassland to the crossing of U.S. Highway 85 approximately 3 miles north of Bowman.

The location of the proposed Bowman Airport was considered in the route selection. On the western side of U.S. Highway 85, the proposed route follows the section line across grassland and cropland. Farmsteads to the north and south were avoided. For the next 5 miles, the proposed route crosses grassland. At the request of a landowner, the proposed route follows the section line instead of crossing diagonally immediately north of U.S. Highway 12. Also in this section, the proposed route accommodates the location of a new rural water pipeline. This segment ends at U.S. Highway 12.

U.S. Highway 12 to Proposed Rhame Substation Segment

This segment begins with the crossing of the Burlington Northern-Sante Fe Railroad and U.S. Highway 12. This crossing was selected because the railroad and highway are close together and parallel. A small field of cropland immediately north of the crossing was avoided. The proposed route turns west at the mid-section line, as requested by the landowner, and turns south for 0.5 mile at Griffin Road.

From this point, the proposed route turns to the west and extends for 5.5 miles across cropland and grassland along the section line, which was selected to avoid farmsteads 1 mile to the north and 1 mile to the south. The proposed route turns south 0.5 mile east of the proposed Rhame Substation to avoid rough terrain and the winding highway. The proposed route runs along the mid-section line to minimize impact to cropland and turns west and then south to enter the proposed Rhame Substation site.

Appendix E

Mitigation Measures, Reclamation, and Best Management Practices

BELFIELD TO RHAME 230-KV TRANSMISSION PROJECT

Mitigation Measures, Reclamation, and Best Management Practices

1. Jurisdictions, Land Use, and Agricultural Practices

Land Use

- The movement of crews and equipment will be limited to the ROW and other areas that have been surveyed for cultural, historical and biological resources. The construction contractor will limit movement on the ROW so as to minimize damage to rangeland, cropland, or property.
- The proposed transmission line will be routed 500 feet or more away from inhabited structures.

Agricultural Practices

- The proposed transmission line will span fields to the extent feasible.
- The proposed transmission line will be routed along section and mid-section lines to avoid diagonal crossings of fields, when possible.
- Where practical, construction activities will be scheduled during periods when agricultural activities would be minimally affected or the landowner will be compensated accordingly.
- Fences, gates, and similar improvements that are removed or damaged will be promptly repaired or replaced.
- ROW will be purchased through negotiations with each landowner affected by the proposed project and payment will be made of full value for crop damages or other property damage during construction or maintenance.
- 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 as an alternative if the landowner desires. Such ruts will be leveled, filled, and graded, or otherwise eliminated in an approved manner. Ruts, scars, and compacted soils from construction activities in cropland or rangeland will be loosened and leveled by scarifying, harrowing, discing, or other appropriate method. Damage to ditches, terraces, roads, and other features of the land will be corrected. The land and other features will be restored as nearly as practicable to their original conditions.

2. Physiography, Topography, Soils, Geology, and Minerals

Soils

- Topsoil will be salvaged and stockpiled during construction of the proposed Rhame Substation; after construction, topsoil will be re-spread.
- Erosion and sediment controls will be established prior to construction, then maintained and controlled through the use of standards BMPs.

- Sediment control measures (e.g., installation of silt fences) will be used, where appropriate, to prevent sediment from moving offsite and into water bodies.
- Maintenance operations will be scheduled during periods of minimum precipitation to minimize the potential of surface runoff and to reduce the risk of erosion, sedimentation, and soil compaction. However, emergency repairs to the proposed transmission line may occur during periods of inclement weather.
- Staging areas will be located in previously disturbed areas, whenever practicable.

Geology

- Transmission line structures will not be sited on any potentially active faults.

3. Hydrology and Drainage

- A 100-foot buffer will be established adjacent to wetlands and creeks, where practicable, to prevent or minimize impacts to those ecosystems. Construction vehicles and equipment will not traverse through wetlands and riparian areas thereby avoiding direct impacts to these sensitive areas.
- Transmission line structures will be sited so that streams and drainages are spanned and remain undisturbed.
- Staging areas and refueling areas will not be located near surface water bodies.
- Areas that need to be cleared during construction will be revegetated with an approved native seed mix as soon as technically feasible to minimize soil erosion and sediment runoff.
- A Spill Prevention and Response Plan will be developed prior to the start of construction to prevent the potential for spills of hazardous substances into streams and drainages, and potential contamination of groundwater. The plan will 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 of construction vehicles will occur at commercial fueling facilities and at staging areas, if onsite fuel storage is needed for refueling.
- A Storm Water Pollution Prevention Plan will be developed and implemented prior to initial construction activities. This plan will include an analysis of materials that will be utilized and site activities that could potentially impact storm water and the associated Best Management Practices (BMPs) to minimize that potential. Plan implementation will include regular inspections of areas under construction, material storage and laydown areas, and structural devices for storm water management. All construction personnel will be trained on the plan and will be required to comply with its requirements and the maintenance of all BMPs. The plan will be maintained until final stabilization of all disturbed areas is completed.

4. Vegetation Resources

- In areas where wooded areas or shelterbelts cannot be avoided, the proposed transmission line will be placed in areas with the lowest density of trees, whenever feasible, thereby reducing the number of trees that will require removal within the construction ROW.
- Woody species (i.e., trees and shrubs) removed (i.e., cut or mowed) during construction will be replaced at a 2:1 ratio (i.e., 2 plants would be planted for every plant removed).

- Prior to construction, a woody (e.g., trees and shrubs) species inventory will be conducted in areas where vegetation will be removed (i.e., cut or mowed) to determine the numbers, sizes, and locations of woody species present in these areas. A Woody Species Inventory Report will be developed, which will summarize the information collected during the woody species inventory. In addition, a Woody Species Planting Plan will be developed that will provide detailed information regarding the numbers, sizes, and locations of species that will be planted and methods used to plant these species.
- All vegetative materials resulting from clearing operations will either be chipped on site, or removed and disposed in a permitted facility.
- Existing native vegetation within the construction ROW will be preserved whenever feasible.
- Surface disturbance areas will be reclaimed using native species and will be planted at the appropriate times, as recommended by agencies or landowners, to reestablish native vegetative cover and minimize the potential for invasion by non-native species.
- Wetland and riparian communities will be spanned by the proposed transmission line thereby avoiding impacts to these ecosystems.
- Erosion and sedimentation controls will be implemented to minimize indirect impacts to wetlands and riparian areas.

5. Wildlife and Fisheries

- Prior to surface disturbance activities during the migratory bird (not including raptors) breeding season (April 15 through July 31), a qualified biologist would survey within suitable habitat (i.e., non-cultivated land) for nesting activity and other evidence of nesting (e.g., mated pairs, territorial defense, birds carrying nest material, transporting food). If active nests are located, or other evidence of nesting is observed, appropriate protection measures, including establishment of buffer areas and constraint periods, would be implemented until the young have fledged and dispersed from the nest area. These measures will be implemented on a site-specific and species-specific basis, in coordination with Western.
- If construction is to occur during the breeding season for raptors (February 1 through August 15), prior to construction activities, raptor breeding surveys will be conducted by a qualified biologist through areas of suitable nesting habitat to identify any active nest sites within 0.5 mile (1.0 mile for bald eagles) from the project area. If applicable, appropriate protection measures, including seasonal constraints and establishment of buffer areas will be implemented at active nest sites until the young have fledged and have dispersed from the nest area. These measures will be implemented on a site-specific and species-specific basis, in coordination with Western.
- Standard measures to minimize avian collision risk with overhead transmission lines, as outlined in *Mitigating Bird Collisions with Power Lines* (APLIC 1994), will be examined and appropriate measures will be developed in coordination with the USFWS and NDGFD.
- Adequate raptor proofing designs, as described in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), will be implemented on the steel H-frame structures in coordination with the NDGFD to minimize raptor use of these structures.

- Holes that are drilled or excavated for pole placement or foundation construction and left unattended overnight will be marked and secured with temporary fencing to reduce the potential for livestock and wildlife entering the holes and for public safety.

6. Special Status Species and Noxious Weeds

Special Status Species

- Prior to construction activities, prairie dog town, black-footed ferret, and burrowing owl occurrence surveys will be conducted by a qualified biologist to identify any suitable black-footed ferret and burrowing owl habitat within the project area. Based on the USFWS 1989 survey guidelines for the black-footed ferret, black-tailed prairie dog complexes/colonies of 80 acres or greater will require surveys for black-footed ferrets. If applicable, mitigation measures will be implemented, in coordination with Western.
- Prior to construction activities, surveys for the presence of migrating whooping cranes will be conducted during the migration periods (April to mid-May and mid-September to October) by a qualified biologist within 1 mile of the project area. If whooping cranes are observed during the survey, Western will coordinate with the USFWS regarding additional mitigation that would be warranted.
- Mitigation measures developed during Section 7 consultations, as specified by the USFWS, will be implemented.

Noxious Weeds

- Prior to the initiation of construction activities, construction vehicles and equipment would be thoroughly cleaned to prevent the possible spread of noxious weed seeds within the project area.
- Noxious weeds present within proposed disturbance areas will be controlled prior to the initiation of construction to prevent the potential spread of noxious weeds.
- If noxious weeds are observed in the surface disturbance areas, populations will be controlled with the application of herbicides, which will be applied by a certified herbicide applicator in accordance with label instructions and state and local County Weed Board regulations. Biological control methods (i.e., use of spurge beetles, etc.) also may be used for weed control.
- Herbicides will not be used near surface water.
- The construction ROW and other surface disturbance areas will be monitored for noxious weeds for a three-year period following construction and reclamation.
- Landowners will be consulted regarding all noxious weed control issues.
- Herbicide applications will occur in late spring or early summer to eradicate or control noxious weeds before they mature.

7. Archaeological and Historic Resources

- Cultural resource surveys will be conducted within proposed surface disturbance areas prior to construction. A Class III cultural resources report will be prepared and sent to Western and the North Dakota SHPO for review and consultation.

- If any previously unknown cultural resources or human remains are discovered during project construction, all work within 200 feet of the discovery that might adversely affect the cultural resource will cease until Western, in consultation with the appropriate parties, could evaluate the discovery. Western will be notified immediately (within 24 hours) and will have a cultural resource specialist or a Tribal monitor with the proper expertise for the suspected resource type on-site as soon as possible. Construction will not proceed until authorized by Western.
- All cultural resources will 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 State Historic Preservation Officer [SHPO], interested Native American groups) will be initiated prior to making the determination. Western will then make a Determination of Eligibility, as required by Section 106 of the National Historic Preservation Act (NHPA) and consult with the appropriate parties to determine any mitigation efforts necessary to eliminate or reduce adverse effects.

8. Paleontological Resources

- Prior to construction, a field survey for paleontological resources will be conducted within the construction ROW and other surface disturbance areas only in exposed rock areas associated with the White River Group and Golden Valley, Sentinel Butte, and Bullion Creek formations. A paleontological report will be developed and provided to Western, which will summarize the results of the field survey. If fossils are observed in these areas, a paleontologist will be present during construction in these areas in order to identify any paleontological resources. If paleontological resources are observed during construction, construction activities in the area will cease and Western will be contacted to discuss the importance of the paleontological resources and develop appropriate mitigation.

9. Transportation Network

- The transportation of materials and equipment will be conducted in accordance with North Dakota Department of Transportation regulations.
- All necessary provisions will be made to conform to safety requirements for maintaining the flow of public traffic. Construction operations will be conducted to offer the least possible obstruction and inconvenience to public traffic.
- Public roads, section lines and existing trails will be used, to the extent practicable, to access the proposed transmission line.

10. Socioeconomic Values

- Potential impacts to populations and housing within the project area will be minimized.

11. Hazardous Materials and Solid Waste

- The proposed project will likely be subject to the requirements associated with hazardous waste management as a small quantity generator as described in 40 CFR 262.

12. Meteorology and Air Quality

- The contractors will apply standard environmental protection measures associated with construction.

- Fugitive dust emissions generated as a result of surface disturbance activities and vehicle use of access roads will be controlled by the periodic application of water, to the extent practicable.
- Vehicles and equipment will be properly maintained to avoid excessive emission of exhaust gases due to poor engine adjustments.
- The speed of vehicles traveling on unpaved roads will be limited, to the extent practicable, to reduce the generation of fugitive dust.
- Burning or burying waste materials within the ROW and proposed Rhame Substation site will not be permitted and all waste materials will be disposed at permitted waste disposal areas or landfills.