Draft Environmental Impact Statement

for the

South Dakota PrairieWinds Project

DOE/EIS #0418

January 2010

Co-lead Agency

U.S. Department of Agriculture

Rural Utilities Service

Co-lead Agency

U.S. Department of Energy

Western Area Power Administration

Cooperating Agency

U.S. Department of The Interior

Fish and Wildlife Service

DRAFT
ENVIRONMENTAL IMPACT STATEMENT

Deer Creek Station Energy Facility Project
Brookings County, South Dakota

U.S. Department of Energy
Western Area Power Administration
Upper Great Plains Region
Billings, Montana

DOE/EIS-0415
January 2010

Western
AREA POWER
ADMINISTRATION

COVER SHEET

Lead Federal Agency: U.S. Department of Energy, Western Area Power Administration
Cooperating Agency: U.S. Department of Agriculture, Rural Utilities Service

Title: Deer Creek Station Project, Brookings and Deuel Counties, South Dakota

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Abstract: In response to a request from Basin Electric Power Cooperative (Basin Electric), Western Area Power Administration (Western) proposes to provide interconnection services, and Rural Utilities Service (RUS) proposes to provide financial assistance, for the Deer Creek Station Project, a proposed 300-megawatt (MW) natural gas-fired generation facility. The facility is being proposed to meet projected intermediate demands for electricity in the eastern portion of Basin Electric Power Cooperative's service territory, as determined from a power supply analysis. Basin Electric's alternatives analysis included alternative power generation technologies and alternative sites. Basin Electric proposes to construct a proposed natural gas-fired combined-cycle facility at one of two sites near White, South Dakota (SD). The alternative sites are convenient to a natural gas supply pipeline and to a transmission line owned by Western. If the proposed Project was not constructed, there would be no effects in the immediate vicinity; however, the underlying power demand would still need to be met and power supply infrastructure would likely be constructed somewhere. If the generation facility were to be constructed at White Site 1, a 13.2-mile natural gas pipeline, a 0.75-mile transmission line, two water wells, and a 1.25-mile water supply line would be constructed, and one mile of local roads would be improved. Most of the impacts associated with the facility site would be on cultivated cropland and pastureland; however, the natural gas pipeline would temporarily impact two small areas of native prairie and several areas of wetlands, and the water supply wells would require pumping from a Well Head Protection Area along Deer Creek. If the generation facility were to be constructed at White Site 2, a 10-mile natural gas pipeline, a one-mile rural water pipeline extension, a one-half mile transmission line, and an on-site substation would also be constructed. Most of the impacts would be on cultivated cropland and pastureland; however, some permanent wetland impacts could be expected. Adverse effects would be minimized by use of best management practices for erosion control and dust suppression, by pipeline construction in the fall, and by avoiding the breeding season for Dakota skipper in native prairie. Monitoring wells would be used to ensure that groundwater pumping does not adversely affect hydrological conditions in Deer Creek.

Comments on this Draft EIS should be sent only to Matt Marsh at Western Area Power Administration at the address above. Comments must be postmarked no later than **March 22, 2010**.

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LIST OF ACRONYMS

A

A....Agricultural zoning district
ADT .... average daily traffic
AE & SSS .... Alternatives Evaluation and Site Selection Study
AERMOD ....AMS/EPA Regulatory Model

B

Basin Electric.... Electric Power Cooperative
BGEPA .... Bald and Golden Eagle Protection Act
BMP ....best management practice

C

CAA ....Clean Air Act
CadnaA ....Computer Aided Design for Noise Abatement
CCCT ....Combined-cycle combustion turbines
CCTV.... closed-circuit television system
CEQ....Council on Environmental Quality
CFR....Code of Federal Regulations
CH_4....methane
CI.... commercial/industrial zoning district
CO ....carbon monoxide
CO_2....carbon dioxide
CREP....Conservation Reserve Enhancement Program
CRP ....Conservation Reserve Program
CTG.... Combustion Turbine Generator
CWA ....Clean Water Act

D

dB....decibel
dBA .... A-weighted decibel
DEIS....Draft EIS
DOE ....Department of Energy
DOT ....Department of Transportation
DSM....demand side management

E

EIA....Energy Information Administration
EIS....Environmental Impact Statement
EMF .... Electromagnetic Fields
EO .... Executive Order
EPA....Environmental Protection Agency
ESA .... Endangered Species Act

F

FAA .... Federal Aviation Administration
FEMA .... Federal Emergency Management Agency
FERC .... Federal Energy Regulatory Commission
FSA .... Farm Service Agency
FWP .... Farmable Wetlands Program

G

GHG .... greenhouse gas
GPA .... Game Production Area
GPS .... Global Positioning System

H

HAP .... hazardous air pollutants
HCM .... Highway Capacity Manual
HP/IP .... high pressure and intermediate pressure
HRSG .... Heat Recovery Steam Generator
HUD .... Housing and Urban Development
Hz .... Hertz

I

IPCC .... Intergovernmental Panel on Climate Change
IS .... Integrated System

L

LGIA .... Large Generator Interconnection Agreement
LGIP .... Large Generator Interconnection Procedures
LOS .... level of service
lp .... low pressure
LP .... Lake Park zoning district
L_X .... exceedance sound level

M

MAPP .... Mid-Continent Area Power Pool
MBPP .... Missouri Basin Power Project
MBTA .... Migratory Bird Treaty Act
MEC .... Mid-American Energy Company
MISO .... Midwest Independent Transmission System Operator
msl .... mean sea level
MW .... megawatt

N

N_2O .... nitrous oxide
NAAQS.......... National Ambient Air Quality Standards
NBPL .... Northern Border pipeline
NESHAP.......... National Emission Standards for Hazardous Air Pollutants
NHPA.......... National Historic Preservation Act
NLCD.......... National Land Cover Data
NO_X.......... nitrogen oxide
NPDES.......... National Pollutant Discharge Elimination System
NPPD .... Nebraska Public Power District
NR.......... Natural Resources zoning district
NRHP.......... National Register of Historic Places
NWI.......... National Wetland Inventory
NWP.......... Nationwide Permit

O

O_3 .... ozone
OHWM .... ordinary high water mark
OSHA.......... Occupational Safety and Health Administration

P

Pb .... lead
PEM .... palustrine emergent
PFO .... palustrine forested
PM.......... particulate matter
PSA .... Power Supply Analysis
PSD .... Prevention of Significant Deterioration
PSE.......... Power Systems Engineering
PSS.......... palustrine scrub-shrub
PUB.......... palustrine unconsolidated bottom

R

REG.......... Recovered Energy Generation
RFP .... Request for Proposals
ROW .... right-of-way
RUS.......... Rural Utilities Service

S

SCR.......... Selective Catalytic Reduction
SD .... South Dakota
SDDA.......... South Dakota Department of Agriculture
SDDENR.......... South Dakota Department of Environment and Natural Resources
SDDOT .... South Dakota Department of Transportation
SDGFP .... South Dakota Department of Game, Fish and Parks

SDPUC........ South Dakota Public Utilities Commission
SGIA........ Small Generator Interconnection Agreement
SGIP........ Small Generator Interconnection Procedures
SHPO........ State Historic Preservation Office
SO_2........ sulfur dioxide
SPCC........ Spill prevention, control, and countermeasure
SWPPP........ Storm Water Pollution Prevention Plan

T

Tariff........ Open Access Transmission Service Tariff
TCP........ Traditional Cultural Properties
TD........ Town zoning district
TMDL........ Total Maximum Daily Limit
tpy........ tons per year
TSI........ Trophic Scale Index

U

USACE........ U.S. Army Corps of Engineers
USDA........ U.S. Department of Agriculture
USFWS........ U.S. Fish and Wildlife Service

V

v/c........ volume to capacity ratio
VOC........ volatile organic compounds

W

Western........ Western Area Power Administration
WIA........ Walk-In Area
WPA........ Waterfowl Production Area
WRP........ Wetlands Reserve Program

* * * * *

EXECUTIVE SUMMARY

PROPOSED FEDERAL ACTIONS

In response to a request from Basin Electric Power Cooperative (Basin Electric or Applicant), Western Area Power Administration (Western) proposes to provide interconnection services at its White Substation for the Deer Creek Station proposed Project, a proposed 300-megawatt (MW) natural gas-fired generation facility in Brookings County, South Dakota. If Western decided to approve the interconnection request, it would add a transformer bay to the White Substation and make other minor system modifications within the substation.

In response to a separate request from Basin Electric, Rural Utilities Service (RUS) proposes to provide financial assistance to Basin for Deer Creek Station construction. The financial assistance would consist of a loan or loan guarantee.

The two requests to Federal agencies trigger environmental reviews under the National Environmental Policy Act (NEPA) (42 U.S.C. 4321-4347). In accordance with the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations (CFR) parts 1500 to 1508), Western has agreed to be the lead agency and RUS has agreed to participate in Western's NEPA review as a cooperating agency. The cooperating agency provisions of NEPA are an efficiency measure that allows the production of one environmental document to serve the decision-making needs of both agencies. Western and RUS prepared this Environmental Impact Statement (EIS) to describe the environmental effects of the Federal and non-Federal actions that would occur if the interconnection and financing actions were to take place.

APPLICANT'S PROPOSED PROJECT

Basin Electric proposes to construct, own, and operate a 300-MW natural gas-fired combined-cycle generation project at a site near White, South Dakota. White Site 1, the Applicant's preferred site, is located six miles southeast of White on 484th Avenue between US Route 14 and South Dakota Route 30 (SD 30). The proposed Project would use combined-cycle technology, in which a gas turbine powers an electric generator. Under the combined-cycle configuration, the exhaust from the combustion turbine generator (CTG) passes through a heat recovery steam generator (HRSG) that extracts heat from the turbine exhaust. This waste heat is used to generate steam that then passes through a steam turbine generator. The recovery of waste heat increases the efficiency of the unit. The footprint of the power generation facility would take up 40 acres of a 100-acre site.

To provide natural gas for the Deer Creek Station facility, a 13.2-mile natural gas line with a right-of-way (ROW) of 75 feet would be constructed northward from the site to access the Northern Border Pipeline (NBPL) in Deuel County, South Dakota. Electricity generated by the facility would be transmitted south of the site to Western's 345-kV White Substation by a 0.75-mile, 345-kV transmission line. Cooling water would be provided by a well site located near Deer Creek, and the water would be transmitted northward to the site by a 1.25-mile, 60-foot wide ROW width, water pipeline. A road to the east of the proposed plant, 484th Street, would be paved for approximately one mile to accommodate construction and operational traffic.

WHY IS THE ACTION NEEDED?

Western is required to respond to an applicant's interconnection request by Federal Energy Regulatory Commission (FERC) orders, which ensure non-discriminatory transmission system access. These FERC orders implement Section 211 of the Federal Power Act, which requires that transmission service be provided upon request if transmission capacity is available. Under Western's Open Access Transmission Service Tariff (Tariff), which implements these FERC orders, Western must ensure that system reliability and service to existing customers is not adversely affected by new interconnections. If the proposed interconnection is compatible with all requirements, Western must approve the interconnection request, subject to NEPA review.

RUS provides financial assistance to rural utilities to upgrade, expand, maintain and replace electric infrastructure in rural areas such as Basin Electric's service territory. Before providing financing, RUS determines that the proposed Project is feasible from both an engineering and financial perspective. Under the authority of the Rural Electrification Act of 1936, RUS makes direct loans and loan guarantees to electric utilities to serve customers in rural areas.

In 2007, Basin Electric developed a Power Supply Analysis (PSA) to assess projected needs of its members (Basin Electric 2007). The PSA indicated that additional intermediate capacity would be needed by mid-2012 to meet its members' growing energy demand. Based on the PSA, a 700 to 800 MW capacity deficit is projected in the eastern portion of Basin Electric's service area by the year 2014. Basin Electric is proposing to meet this increased demand by implementing a resource expansion plan that includes 200 MW of peaking generation, 300 MW of wind generation, 250 MW of intermediate generation, and 600 MW of baseload generation. The Deer Creek Station proposed Project is a means to meet the additional intermediate power supply needs in the area. Intermediate capacity units are designed to be cycled at low load periods, such as evenings and weekends. The units can be cycled up and down rapidly to handle the load swings of the system. The proposed Project has been sized for 300 MW in order to meet the 250 MW intermediate power supply need and have a 50 MW reserve to meet peak intermediate needs. An advantage of using intermediate generation is that wind generation on the grid in the same area can be integrated with the combined-cycle natural gas generation. During periods of high wind generation, gas-fired generation can be reduced. During periods of low wind generation, the gas-fired generation will be available to back up the wind generation.

PUBLIC AND AGENCY ISSUES

A notice of intent to prepare an EIS and to conduct scoping meetings was published on February 6, 2009, in the *Federal Register*. An open house public meeting was held in White, South Dakota on February 24, 2009. There were 59 attendees at the scoping meeting. In addition, Federal, State, and local agencies and interested parties were notified of the proposed Project by letter from Western. The period to receive written comments was open until April 7, 2009. As a result of the scoping process, 14 comments were received from 12 agencies and two individuals. Concerns noted in the comments included local traffic impacts from construction and operation, dust issues from heavy traffic, impacts to air quality, groundwater and Well Head Protection Areas, wetlands, impacts to endangered species and the bald eagle, impacts to birds from transmission lines, and economic benefits to local communities.

ALTERNATIVES FOR INTERMEDIATE POWER SUPPLY NEEDS

In order to meet intermediate power supply needs, Basin Electric considered several power supply alternatives for intermediate needs. These included demand side management (DSM), renewable energy resources, fossil fuels, repowering and uprating of existing facilities, and power purchase contracts.

DSM actions are actions taken on the customer's side of the meter to change the amount or timing of energy consumption. Basin Electric currently has 6 to 10 megawatt (MW) of DSM available to reduce power usage during peak periods. Even if this could be greatly expanded, it would not be enough to meet all intermediate power needs.

As indicated above, wind is a renewable energy resource that would integrate well with a natural gas intermediate facility because the gas can be quickly brought on-line during periods of low wind generation. Solar energy and new hydroelectric power are other intermediate power resources, but they are very costly and additional hydroelectric power is not available in the upper Midwest. Other renewable energy resources such as geothermal and biomass are more suitable to baseload applications. High temperature geothermal resources suitable for power production are not available in eastern South Dakota.

Basin Electric screened five potential sites within its eastern South Dakota service area for development of an intermediate capacity facility. Screening criteria used included access to a high-voltage transmission system with available capacity, natural gas fuel supply, water supply, existing land use and terrain, and proximity to residences. The sites considered suitable were near Aberdeen (Groton site), Watertown (one site), and Brookings (three sites). Based on a field review of the five sites, Groton was rejected because of transmission constraints and the previous installation of two simple-cycle peaking facilities. Watertown was rejected due to distances to the nearest substation. White Site 3 was determined to be too small for a combined-cycle combustion turbine facility. The proposed facility at White Site 1 is described above.

White Site 2 has been evaluated as an alternative in this EIS. A facility at White Site 2 would be located north of SD 30 and four miles northeast of White, South Dakota on 482nd Avenue. Its footprint of 40 acres on a 100-acre site would be similar to White Site 1; however, an additional six acres of the site would be needed for a substation. To provide natural gas for the White Site 2 facility, a 10-mile natural gas line would be constructed northward from the site along 481st Avenue to access the NBPL in Deuel County, South Dakota. Electricity generated by the facility would be transmitted east of the site from the new substation to the Western Split Rock to White 345-kV transmission line located 0.5 miles east of the site. Cooling water would be provided by municipal water supply. A water line extension of one mile would be constructed along 202nd Street from 481st Avenue east to the site.

Repowering and uprating of existing intermediate generating units was also an option considered. Repowering and uprating has been underway at the Laramie River Station, a project owned by Basin Electric and other utilities. Each of the three units at Laramie River Station has achieved 12- MW uprates due to upgrades. In addition, the Leland Olds Station has also been uprated by 5.5 MW. While these upgrades have increased the intermediate capacity, the scale of these past improvements, suggests that uprates and repowering alone would not alleviate the need for intermediate resources provided by the proposed combined-cycle facility.

Power purchase from facilities within the region or outside the region was another option evaluated. Basin Electric has negotiated a power purchase agreement with Recovered Energy Generation (REG) power plants for 22 MW, but has determined that other power purchase options were more expensive than Basin Electric's self-build options. In addition, many other options would require the construction of additional transmission.

Based on the power supply options analysis and the screening conducted by Basin Electric, Western, and RUS decided that White Sites 1 and 2 and the No Action Alternative would be selected for evaluation in this EIS.

COMPARISON OF ALTERNATIVES

Under the No Action Alternative, Western would not approve an interconnection agreement to its transmission system and RUS would not award a loan or loan guarantee to finance the construction and operation of the proposed Project. Given the lack of a Western interconnection and RUS funding, Basin Electric would not likely construct the proposed Project as described in this EIS. As Basin Electric is a regulated utility having load growth responsibility, it is reasonable to expect that it would construct a similar generation facility elsewhere in eastern South Dakota. Such a facility may not connect to a Federal transmission system, involve Federal financing, or have any other Federal nexus and, therefore, would not initiate a NEPA process. If Western were not to approve the interconnection agreement and RUS were not to award a loan or loan guarantee, the environmental impacts associated with the construction and operation of the proposed Project at this location would not occur. Basin Electric would have to find an alternate means to increase the intermediate generation demand for electric power in the eastern portion of its service area through some other project proposal, which could result in environmental impacts similar to, or greatly different from, those identified for the proposed Project.

Construction at either White Site 1 or White Site 2 would likely have similar impacts to the natural and socioeconomic resources. The terrain of White Site 1 allows for better drainage than White Site 2. White Site 1 is also further away from the nearest occupied residence (1 mile compared to 0.5 mile). However, White Site 1 would require a longer natural gas pipeline. In addition, water supply wells would be constructed in the floodplain of Deer Creek in order to provide cooling water to White Site 1. White Site 2 would have a greater facility footprint, due to the need to construct a substation, and would be more visible to travelers and residents of the area because it is close to SD 30. Table ES-1 summarizes and compares the environmental impacts as described in this EIS. Standard mitigation measures to be used by Basin Electric for the proposed Project are provided in Appendix F.

Table ES-1: Summary of Potential Impacts of Deer Creek Station

Resource	White Site 1	White Site 2	No Action Alternative
Air	Increase in emissions during construction from vehicles and equipment would be minimal for carbon monoxide (CO), nitrogen oxide (NO_x), and volatile organic compounds (VOC); particulates (dust) from site preparation and traffic on unpaved roads; all construction and operation emissions meet regulations; *de minimis* emissions of hazardous air pollutants (HAP); largest potential HAP is formaldehyde at 4.5 tons per year (tpy)		No impact
Greenhouse Gas (GHG) Emissions	Not a major source of GHG emissions; estimated carbon dioxide (CO_2) emissions three one thousandths of one percent (0.00003) of global man-made emissions		No impact
Geology, Soils and Farmland	No unique geologic features; prime farmland impacts of 40 acres of the 100-acre facility site (40 acres of permanent impact and 60 acres still available for hay or pasture); loss of 1 acre at water well supply site	No unique geologic features; prime farmland impacts of 46 acres of the 100 acre facility site (46 acres of permanent impact and 54 acres remaining available for hay or pasture)	No impact
Water Quality	Potential sedimentation from site preparation, pipeline construction, transmission line construction, road improvements, and water line construction. No disturbance of pre-existing contamination; some use of hazardous chemicals on site	Potential sedimentation from site preparation, pipeline construction, transmission line construction, substation construction, and water line construction. No disturbance of pre-existing contamination; some use of hazardous chemicals on site	No impact
Floodplains	No floodplains on facility site; water well located in Deer Creek floodplain; pipeline construction crosses floodplains	No floodplains on facility site; pipeline construction crosses floodplains	No impact
Groundwater	Pumping of six million gallons per year or 18 acre-feet from Big Sioux aquifer for cooling water; crossing by natural gas pipeline of Zone B Well Head Protection Areas (29,262 linear feet)	Six million gallons per year of water would be obtained from municipal water supply, which is obtained from Big Sioux aquifer. Crossing by natural gas pipeline of Zone A Well Head Protection Area (805 linear feet) and Zone B (8,033 linear feet)	No impact

Resource	White Site 1	White Site 2	No Action Alternative
Wetlands and Streams	Based on National Wetland Inventory (NWI), impacts of 0.0 acres on facility site, 0.0 acres for transmission line corridor, and 0.0 acres for water pipeline corridor; temporary impacts of 1.75 acres in natural gas pipeline corridor; delineated wetlands of 3.2 acres on facility site, to be avoided to the extent practicable; delineated temporary impacts of 6.6 acres in natural gas pipeline corridor, 2.5 acres in water pipeline corridor, and 0.2 acres in transmission line corridor; some high quality potholes crossed	Based on NWI, wetland impacts of 0.02 acres on facility site and 0.21 acres for substation; temporary impacts of 1.70 acres for transmission line corridor, 0.05 acres in rural water pipeline corridor, and 0.61 acres in natural gas pipeline corridor; some high quality prairie potholes crossed	No impact
Vegetation	Existing site is cultivated cropland; a 100-foot wide corridor would be cut through an existing narrow forested shelterbelt along the eastern edge of the site for a waterline and access road; natural gas pipeline is 47 percent cultivated cropland and 34 percent pasture; distance through native prairie is 2,620 linear feet	Existing site is cultivated cropland; woodland on site would be avoided; natural gas pipeline is 55 percent pasture and 40 percent cultivated cropland, and 5 percent forested shelterbelt; no native prairie impacts	No impact
Wildlife	Minimal impacts; generation facility would be near inactive raptor nests and great horned owl nest; transmission line of 0.75 mile poses some collision risk to avian species	Minimal impacts; transmission line of 0.50 mile poses some collision risk to avian species	No impact
Special Status Species	Topeka shiner habitat in nearby Deer Creek and tributaries would not be impacted; also suitable habitat for Dakota skipper	Suitable habitat for Dakota skipper	No impact
Socioeconomics	360 temporary construction workers and 30 permanent employees; local government services adequate for worker influx; positive benefits from property taxes and right-of-way (ROW) easements		No impact
Environmental Justice	No impact	No impact	No impact

Resource	White Site 1	White Site 2	No Action Alternative
Land Use	115 acres converted to utility uses (75 still available for agriculture); new 13.2-mile pipeline ROW (all still available for agricultural uses)	109 acres converted to utility uses (63 still available for agriculture); new 10 mile pipeline ROW (all still available for agricultural uses)	No impact
Transportation	No adverse level of service impacts; roadways to be paved at intersections and near plant site; heavy haul temporary bridge over Deer Creek	No adverse level of service impacts; roadways to be paved near plant site	No impact
Visual	Project visible for up to four miles but would mix in with wind turbine views	Project visible for up to four miles; highly visible from SD 30; would mix in with wind turbine views; new substation would be additional new visual intrusion	No impact
Noise	Construction noise impacts; short term steam blow event; operational impacts within Department of Housing and Urban Development (HUD) guidelines	Construction noise impacts; short term steam blow event; operational impacts within HUD guidelines	No impact
Public Health and Safety	Conformance to all Occupational Safety and Health Administration (OSHA) safety procedures for plant workers; minor general public impacts from increased traffic		No impact
Intentional Destruction	Minor security issues		No impact
Cultural Resources	No impacts to National Register of Historic Places (NRHP) eligible properties	Potentially NRHP-eligible sites on natural gas pipeline route	No impact
Recreation	Temporary impact to one Walk-in Area (WIA) (State hunting lease area) during pipeline construction	No impacts to public lands or hunting lease areas	No impact

MAJOR CONCLUSIONS

Construction of a natural gas combined-cycle generation facility at either White Site 1 or White Site 2 would not result in any significant environmental impacts. Approximately 100 acres of agricultural land would be within the proposed Project fence; at White Site 1, 40 acres would be permanently converted to utility uses and 60 acres would be available for hay or pasture. At White Site 2 an additional 6 acres would be permanently converted. White Site 1 would result in groundwater pumping from the Big Sioux aquifer along Deer Creek, but water for White Site 2 would be obtained from a municipal water supply, which withdraws from a different location within the same aquifer. There is the potential for temporary impact to native prairie and Dakota skipper habitat along the White Site 1 Natural Gas Pipeline route. These impacts would be minimized through a consultation process with State and Federal wildlife agencies. Positive social and economic impacts would be expected from Deer Creek Station construction. The relatively minor environmental impacts of Basin Electric's proposed Project on environmental resources would be offset by the societal benefits of a new source of electricity. It is not possible to quantify this benefit, as individuals would weigh the tradeoffs differently, and assign widely variable values to each resource.

AREAS OF CONTROVERSY

No areas of controversy were identified during the scoping stages. This section will be updated following review of responses to the Draft EIS (DEIS).

ISSUES TO BE RESOLVED

The analysis of impacts in this DEIS is based on conceptual design. The precise impacts to environmental resources such as wetlands and endangered species will be determined during the environmental permitting and consultation stage. However, as a result of this analysis, Basin Electric has committed to implement the following measures to avoid and minimize the potential for adverse effects:

- Best management practices (BMPs) for sediment and erosion control
- Stormwater Pollution Prevention Plan (SWPPP) including BMPs, Spill Prevention Control and Countermeasure Plan (SPCC), and good housekeeping measures for construction
- Dust control plan for roads and site construction
- Improvements to traffic control, including removal of a stop sign on northbound 484th Avenue at 207th Street intersection, and designated delivery route to avoid traffic on additional routes
- Monitoring wells would be installed to determine the cone of influence from water pumping along the Deer Creek floodplain and avoid permanent impacts to Deer Creek

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1.0 INTRODUCTION

Basin Electric Power Cooperative (Basin Electric) is proposing to construct, own, operate, and maintain a new 300-megawatt (MW) net natural gas generation facility and infrastructure facilities (proposed Project). After a review of alternative site locations, Basin Electric determined that a location in eastern Brookings County, South Dakota, would best meet that need. As a result of the alternative site location studies, Basin Electric identified two potential sites. The proposed Project area is located approximately 14 miles northeast of the City of Brookings (figure 1-1). In addition to the generation facility, the proposed Project would include ancillary facilities such as a natural gas pipeline for fuel delivery, electrical transmission facilities to connect to the existing Department of Energy (DOE) Western Area Power Administration (Western) White Substation, either a water well system or water delivery from existing rural water system, and wastewater processing. Basin intends to request financing from the U.S. Department of Agriculture (USDA) Rural Utilities Service (RUS) to construct the proposed Project. The Federal action would consist of interconnection of the proposed Project transmission facilities with Western's transmission system at its existing White Substation, installation of terminal equipment within the substation, and or the granting of a loan or loan guarantee from RUS.

Basin Electric is a regional wholesale electric generation and transmission cooperative owned and controlled by the member cooperatives it serves. It was created in May 1961 as a result of regional efforts by electric distribution cooperatives and the Rural Electrification Administration, now RUS. Basin Electric includes more than 120 rural electric systems and is one of the largest electric generation and transmission cooperatives in the U.S. Basin Electric serves approximately 2.5 million customers in 430,000 square miles covering portions of nine states: Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota, and Wyoming (figure 1-2).

Basin Electric, as the Applicant, has submitted requests to interconnect its proposed Project to Western's transmission system and has submitted a loan application to RUS for financing. Requests for interconnection and financial assistance are Federal actions, triggering appropriate environmental review under the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations (CFR) parts 1500-1508), DOE National NEPA Implementing Procedures, 10 CFR part 1021, and RUS Environmental Policies and Procedures, 7 CFR 1794, as amended. Western is the lead Federal agency as defined at 40 CFR part 1501.5; RUS is serving as a cooperating agency.

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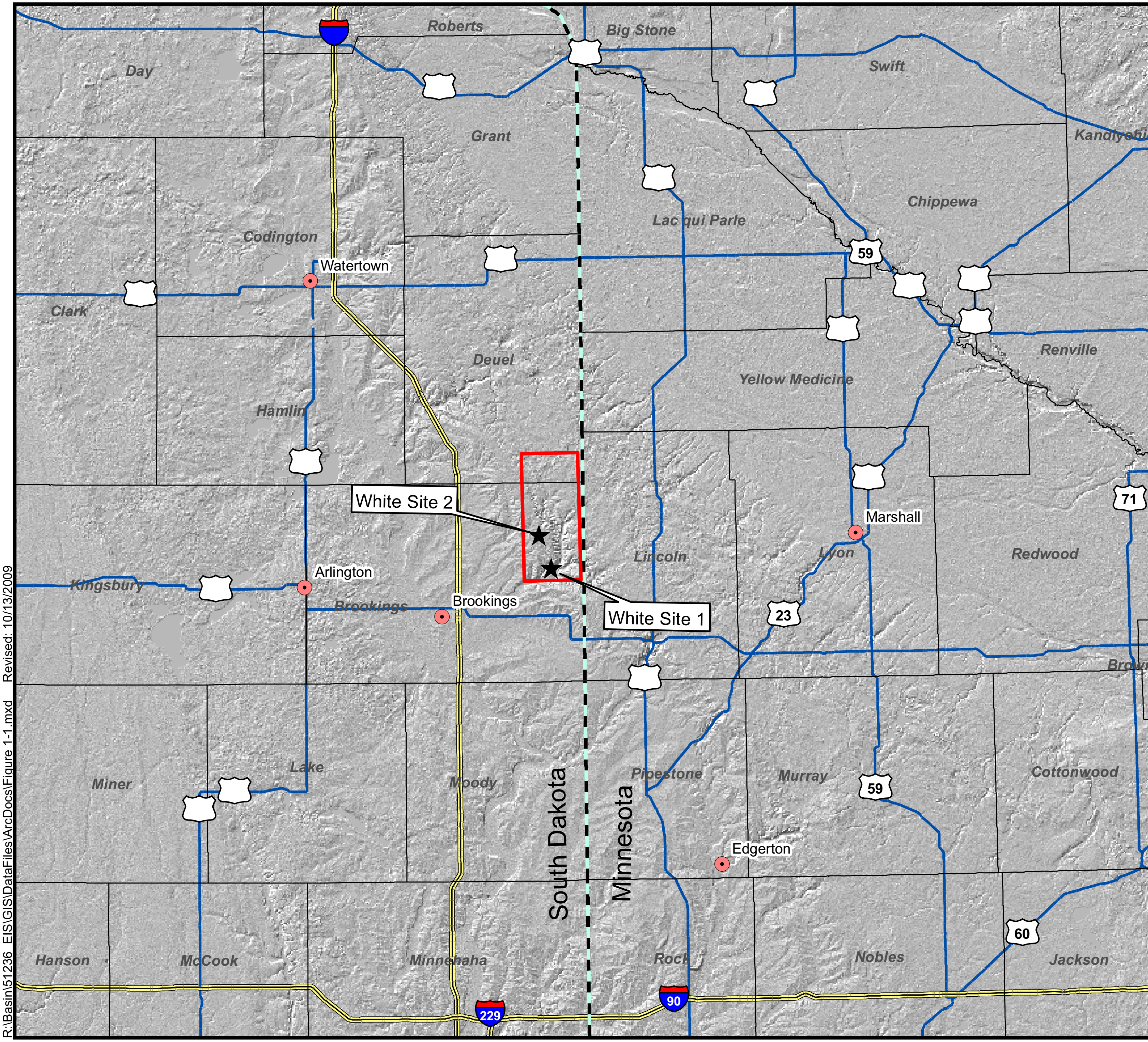

Figure 1-1
Location Map
Deer Creek
Station EIS

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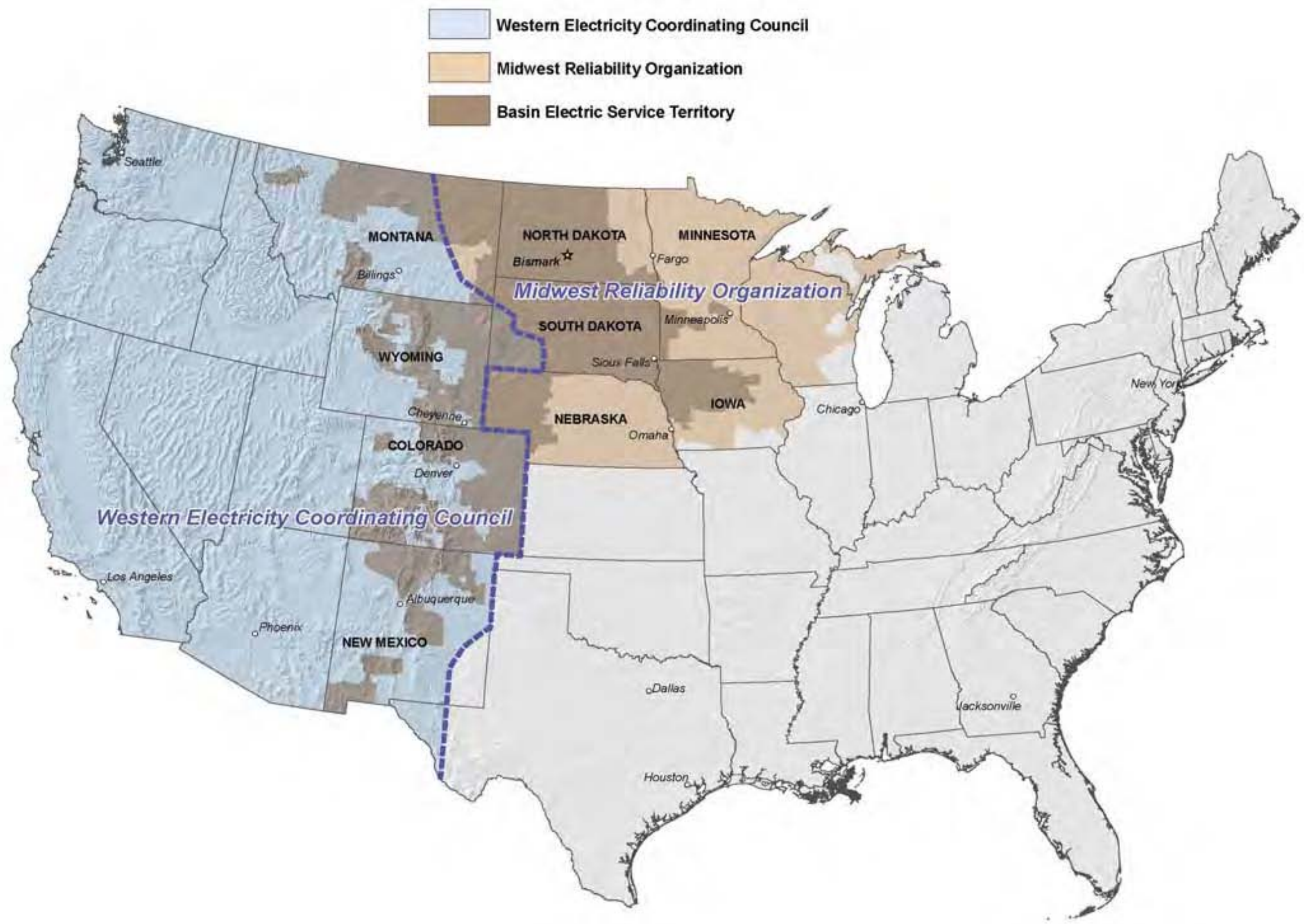
Figure 1-2: Basin Electric Service Area



Western and RUS have prepared this Environmental Impact Statement (EIS) under these regulations to describe the environmental effects of their respective Federal actions and Basin Electric's proposed Project and alternatives, including the No-Action Alternative.

1.1 WESTERN'S PURPOSE AND NEED

The Applicant proposes to interconnect its proposed Project with Western's White Substation. Western's purpose and need is to consider this interconnection request in accordance with section 211 of the Federal Power Act and Western's Open Access Transmission Service Tariff (Tariff). Section 211 of the Federal Power Act requires that transmission service be provided upon request if transmission capacity is available. Western's Tariff provides open access to its transmission system. If there is available capacity in the transmission system Western provides transmission services through an interconnection. This interconnection request requires Federal action, which triggers NEPA review. When responding to the need for agency action, Western is bound by the following:

Providing Transmission Service - Under Western's Tariff, Western offers capacity on its transmission system to deliver electricity when capacity is available. The Tariff complies with the Federal Energy Regulatory Commission's (FERC) Final Orders, which are intended to ensure non-discriminatory transmission system access. Western submitted revisions to its non-jurisdictional Tariff on January 25, 2005 as to certain terms and for inclusion of the Large Generator Interconnection Procedures (LGIP) and a Large Generator Interconnection Agreement (LGIA). On March 1, 2007, Western submitted revisions to its Tariff to FERC pursuant to FERC Orders No. 2003-C, 661, 661-A, 676, 676-A, 2006, 2006-A and 2006-B. The main purpose of this filing was to incorporate FERC's Small Generator Interconnection Procedures (SGIP) and Small Generator Interconnection Agreement (SGIA), and also to include revisions of certain terms relating to the LGIP and the LGIA. Western received final approval on its 2005 and 2007 filings from FERC on September 6, 2007. In order to comply with FERC's recent Order Nos. 890, 890-A, 890-B, and 890-C, and sections 35.28(e) and (f)(iv)(2) of its Regulations, Western submitted proposed revisions to its Tariff in September 2009.

Protecting Transmission System Reliability and Service to Existing Customers - Western must ensure that existing reliability and service is not degraded. Western's LGIP provides for transmission and system studies to ensure that system reliability and service to existing customers are not adversely affected by new interconnections. These studies also identify any system upgrades or additions necessary to accommodate the proposed Project and ensure that they are in the project scope.

1.2 RUS PURPOSE AND NEED

Under the authority of the Rural Electrification Act (REA) of 1936, the Electric Programs of RUS provide loans and loan guarantees to rural electric cooperatives to finance the construction of electric distribution, transmission and generation facilities, including system improvements and replacements, energy conservation programs, and on-grid and off-grid renewable energy systems. The Applicant has requested financial assistance from RUS. This request is a Federal action; therefore, RUS has the need to respond to the Applicant's request for assistance by approving or denying the request.

In deciding whether to approve a loan or loan guarantee, RUS considers if the Applicant has provided sufficient justification for pursuing a proposal. This decision is based upon a review of an Alternatives Evaluation and Site Selection Study (AE &SSS), energy demand and transmission load forecasts, and potential environmental impacts associated with a proposal. In 2007, Basin Electric developed a Power

Supply Analysis (PSA) to assess projected needs of its members from Basin Electric's 2007 Load Forecast, which was approved by RUS on November 26, 2007. RUS has determined that approving a loan or loan guarantee for the proposed Project may constitute a major Federal action that could significantly affect the quality of the human environment; therefore, an EIS would have to be prepared prior to a decision on financing.

1.3 APPLICANT PURPOSE AND NEED

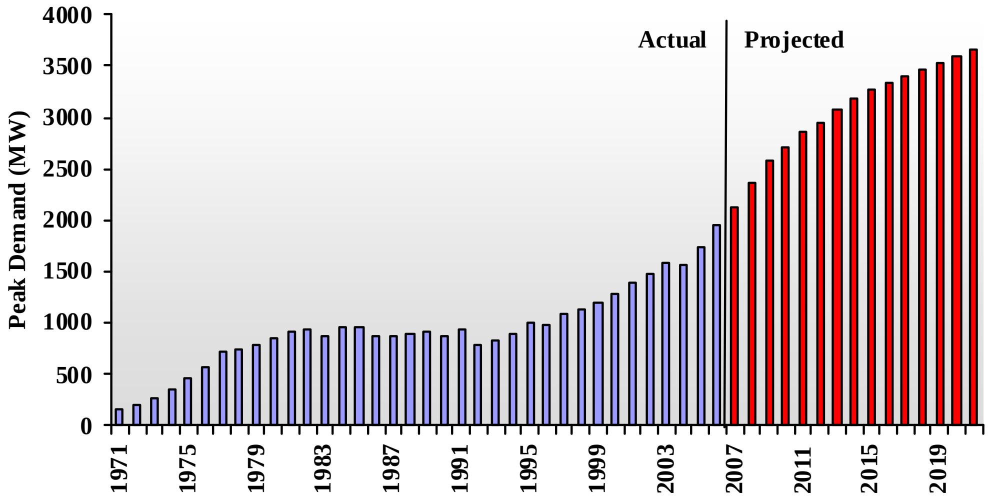
The purpose of the Basin Electric's proposed Project is to help serve the increased demand for electrical power to member cooperatives in the eastern portion of Basin Electric's nine-state service area. To meet this purpose and need, Basin Electric proposes to construct their generation facility and to connect it to Western's electrical transmission grid. An additional value of this generation is the potential to combine the operation of this combined-cycle intermediate generation with Basin Electric wind energy development on the electrical transmission grid. Under this combined Basin Electric resource operation, the gas-fired generation would be operated during periods of high demand and low wind generation, and would be backed down during periods of high wind generation.

In 2007, Basin Electric developed a PSA to assess projected needs of its members (Basin Electric 2007). This analysis identified an increasing use and demand for electricity within Basin Electric's service area due to industrial growth, energy-sector development (coal, oil, and natural gas), and new rural residential development. Figure 1-3 shows Basin Electric's actual peak demand from 1971 through 2006 and Basin Electric's forecasted peak demand from 2007 through 2021. Between 1999 and 2006, Basin Electric's total system peak demand increased 752 MW, from 1,195 MW to 1,947 MW. This is an increase of approximately 107 MW per year.

Basin Electric prepared a forecast showing load and capability surpluses and deficits through the year 2021. The forecast predicts that by 2014, there will be an anticipated deficit of 700-800 MW for the eastern portion of its service area (figure 1-4). According to the PSA, Basin Electric proposed to meet this increased demand by implementing a resource expansion plan that includes:

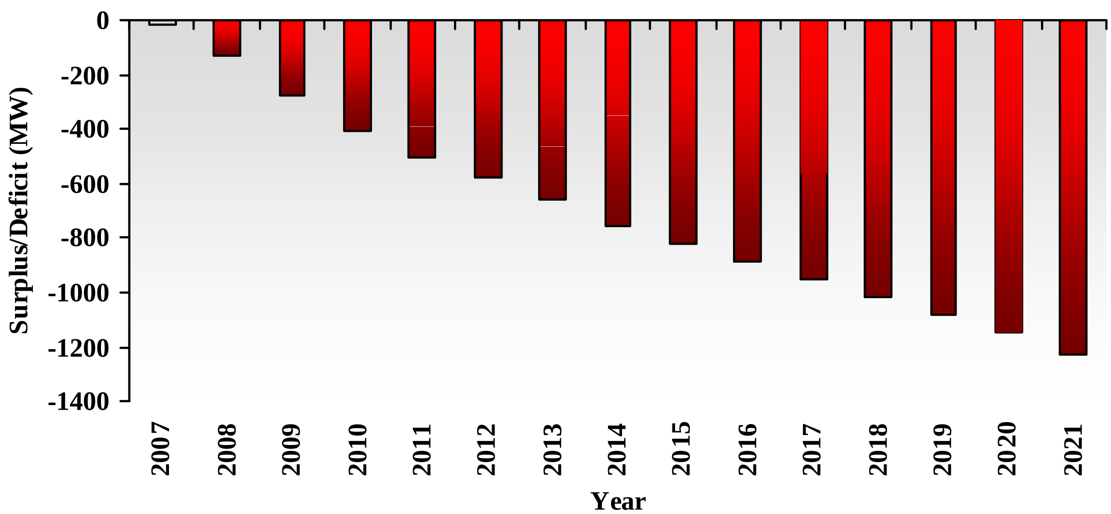
- 200 MW of peaking generation (2009)
- 300 MW of wind generation (2011)
- 250 MW of intermediate generation (2012)
- 600 MW of baseload generation (2016)

Figure 1-3: Basin Electric Peak Demand



Source: Basin Electric 2007

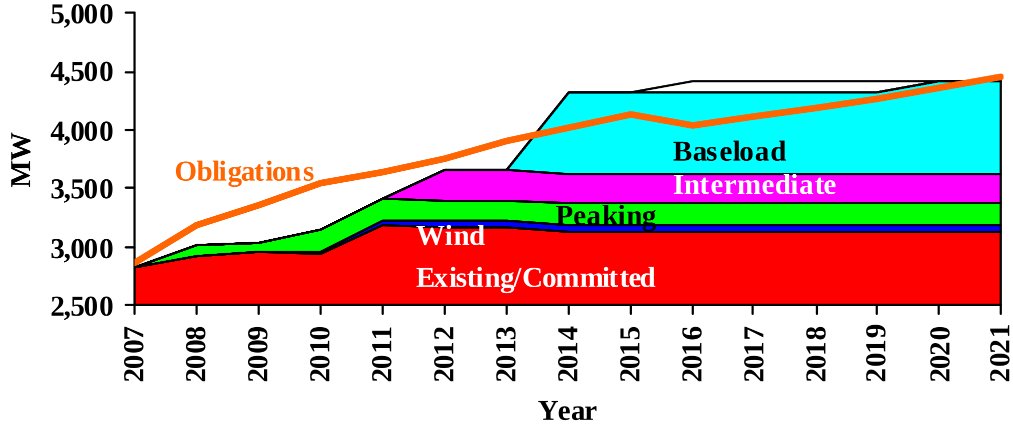
Figure 1-4: Basin Electric Power Supply Deficit in Eastern Service Area



Source: Basin Electric 2007

Although the study was completed in 2007, Basin Electric believes that its long-term projections are still accurate. Figure 1-5 shows the preferred resource expansion plan identified in the PSA. One recommendation of the PSA was that Basin Electric should move ahead with the development of 250 MW of intermediate generation, such as a combined-cycle combustion turbine within Basin Electric's eastern system. The proposed Project has been identified as a means to meet the determined need for 250 MW of intermediate generation by 2012. The proposed Project has been sized for 300 MW in order to meet the 250 MW need and have a 50 MW reserve to meet peak intermediate needs.

Figure 1-5: Basin Electric Power Supply Expansion Plan



Source: Basin Electric 2007

1.4 AUTHORIZING ACTIONS

The proposed Project must comply with all Federal, State, and local regulations requiring permits or approvals. Table 1-1 lists agencies and their respective permit/authorizing responsibilities with respect to the proposed Project. The South Dakota Public Utilities Commission (SDPUC) has jurisdiction over the siting of power plants within the State of South Dakota. The Applicant submitted applications for an Energy Conversion Facility Permit and a natural gas pipeline to support the facility on July 28, 2009 (SDPUC 2009a; SDPUC 2009b). If granted, the SDPUC permit would authorize construction of the proposed Project under South Dakota rules and regulations.

Table 1-1: Authorizations and Agencies

Law/Regulation	Agency
Federal	
NEPA	Western / RUS
Clean Water Act (CWA), section 404 Nationwide Permit (NWP)	U.S. Army Corps of Engineers (USACE)
CWA, section 401 (Water Quality Certification)	South Dakota Department of Environment and Natural Resources (SDDENR)
National Pollutant Discharge Elimination System (NPDES) Permit	U.S. Environmental Protection Agency (EPA)
Migratory Bird Treaty Act (MBTA)	United States Fish and Wildlife Service (USFWS), Western/RUS
Endangered Species Act (ESA)	USFWS, RUS
Bald and Golden Eagle Protection Act (BGEPA)	USFWS, Western
Interconnection/Transmission Service Agreement	Western

Law/Regulation	Agency
NHPA	Western/RUS, South Dakota State Historic Preservation Office (SHPO), Federally Recognized Tribes
Native American Grave Protection and Repatriation Act	Western/RUS, SHPO
American Indian Religious Freedom Act	Western
Oil Pollution Prevention and Spill Prevention Control and Countermeasure Plans	EPA
State	
Temporary Water Rights Permit (if dewatering is required)	SDDENR
Easement Grants and Road Crossing Permits	South Dakota Department of Transportation (SDDOT)
Highway Access Permit/Utility Permit	SDDOT
Stormwater Discharge Permit and Stormwater Construction Discharge Permit	SDDENR
Facilities Permit (for Project)/Siting Authorization	SDPUC
State Threatened and Endangered Species	South Dakota Department of Game, Fish and Parks (SDGFP)
County	
Soil Erosion and Sediment Control Plan	Brookings and Deuel Counties
Zoning Ordinance	Brookings and Deuel Counties

1.5 AGENCY CONSULTATION AND PUBLIC INVOLVEMENT

Agency and public scoping occurred during February 6, 2009, to April 7, 2009. During that period public notices were published, a scoping meeting was conducted and 14 written comments were received.

1.5.1 Scoping Process

A Notice of Intent to prepare an EIS was drafted by Western and published in the *Federal Register* on February 6, 2009. The scoping meeting for the proposed Project was held approximately 2 miles west of the Project Area, at the McKnight Community Center in White, South Dakota, on February 24, 2009. Western mailed letters announcing the scoping meeting to Federal, State, Tribal, local agencies and landowners near the proposed Project sites during early February, 2009. RUS was not involved in the scoping process, since Basin Electric had not yet approached that agency for Project funding.

Notice of the public scoping meeting was published in two local newspapers. The notice was published in the Brooking Register on February 6, February 13, and February 20, 2009, and in the White Tri-City Star on February 12 and February 19, 2009. Radio spots announcing the scoping meeting were aired seven times a day during February 16-20, 2009, on both Brookings radio station KBRK-FM 93 and

Watertown radio station KWAT-AM. Additionally, flyers publicizing the scoping meeting were distributed to local businesses.

Basin Electric participated in lease negotiations with area landowners during the development of the proposed Project, and consulted with various local, State, and Federal agencies to provide information about and identify concerns regarding the proposed Project.

During the scoping meeting, project factsheets and comment response/distribution list request forms were available for all meeting participants. Western and Basin Electric also provided display boards to present project information for public viewing.

1.5.2 Identified Issues

During the scoping period, letters requesting project-related comments were mailed to Federal, State, and local agencies as well as Native American tribes located near the proposed Project area. During the scoping meeting, attendees were provided with comment forms. They were asked to write down any comments and either return the forms at the meeting or mail them in order that they would be received or postmarked by the close of the scoping period, which ended on April 7, 2009. Western received a total of 12 written comments from agencies and two written comments from individuals. Listed below are the topics identified in the comments received and Western's responses. A Scoping Summary has been prepared and is included as appendix A.

Cultural Resources

One comment requested that Western initiate the section 106 process and consult with the South Dakota SHPO, Native American tribes, and other concerned parties with regard to protection of historic properties. Potential impacts to cultural resources are addressed in section 4.14.

Water Resources

Five comments were received requesting discussion and analysis of potential impacts to groundwater, surface water, drinking water, irrigation waters, and floodplains as a result of the construction and operation of the proposed Project. Two of these comments also addressed potential impacts to Wellhead Protection Areas and impacts to local groundwater supply near the proposed well site for the proposed Project. Two comments specifically requested compliance with section 404 of the CWA. Appropriate permitting requirements and potential impacts to water resources within the proposed Project area are discussed in section 4.3.

Wetland Resources

Three comments were received requesting analysis of potential impacts to wetlands within the proposed Project area, and two of these comments specifically requested compliance with section 404 of the CWA. These comments also requested that the EIS include mitigation measures if avoidance of wetlands is not possible. Regulatory compliance with section 404, along with potential wetland impacts, is discussed in section 4.4.

Biological Resources

Three comments were received that included biological resources concerns. Two of these comments requested prevention of the introduction and spreading of invasive plants and noxious weeds. One comment requested evaluation of the effects of the proposed Project on vegetation, wildlife, and hunting and fishing opportunities. Two comments also expressed concern over threatened and endangered species possibly occurring in the proposed Project area, and requested an evaluation be completed to determine if impacts to any species is expected, and that measures be put into place to protect any sensitive species that are encountered. One comment expressed a concern for avian mortality resulting from collisions with transmission lines associated with the proposed Project, and recommended incorporating measures to prevent line strike and electrocution hazards for avian species. All potential impacts to biological resources, including threatened and endangered species, are discussed in detail in section 4.5.

Air Quality

Two comments were received regarding impacts to air quality in the proposed Project area. One comment recommended an evaluation of potential contribution to near and far-field air quality and greenhouse gas (GHG) emissions resulting from the construction and operation of the proposed Project. One comment recommended a detailed plan for addressing dust suppression during construction of the proposed Project, and one commenter expressed concern over general air pollution resulting from the proposed Project. Air quality issues and potential impacts are discussed in detail in section 4.1.

Socioeconomics

Two comments were received regarding socioeconomic concerns or issues. One comment requested the disclosure and evaluation of any environmental justice impacts, and one comment requested information on economic benefits to the communities of Toronto, Astoria, and White. This comment also requested information on the long-term outlook for wind energy in the area. Socioeconomic issues and impacts related to the proposed Project are discussed in section 4.6.

Transportation

Three comments were received regarding transportation issues related to the proposed Project. Two comments focused on impacts to local roads and bridges, and their ability to handle heavy loads and increased traffic associated with the proposed Project. One commenter expressed concern over impacts to living conditions, traffic congestion, and dust from gravel roads impacting residences. One comment requested that Western contact Federal Aviation Administration (FAA) Technical Operations, Brookings Municipal Airport, and White Airport to identify possible impacts to aircraft navigation and/or communication equipment. This comment also requested that the design, construction, and operation of the proposed Project not create a hazardous wildlife attractant to surrounding airports. Transportation issues, including regulatory issues from FAA, are discussed in section 4.9.

Soil/Land Resources

Three comments regarding soil or land resources were received during the scoping period. One comment requested that, should contaminated soil or materials be encountered during construction activities, the contamination would be reported to the appropriate agency, and that contaminated soil will be stockpiled and sampled to determine disposal requirements. One comment requested the completion of the Farmland Conversion Impact Rating form for the proposed Project site to determine impacts to prime farmland, and another comment stated that there are no Farm Service Agency (FSA) mortgages or Conservation Reserve Program (CRP) tracts known to be in place within the proposed Project area. Contaminated soil is discussed in section 4.12 and farmland is discussed in section 4.2.

Hazardous Materials

One comment was received regarding hazardous materials associated with the proposed Project. The commenter suggested that additional research be conducted regarding past petroleum and chemical releases in the area that could affect the proposed Project area. Issues relating to hazardous materials are discussed in section 4.12.

Safety

One comment was received regarding a concern for worker safety due to weather during the construction phase of the proposed Project. Safety during construction and operation of the proposed Project is discussed in section 4.12.

Cumulative Impacts

One comment was received requesting a cumulative impacts analysis for resources of concern. Cumulative impacts are discussed with each environmental resource in section 4 following discussion of direct and indirect impacts.

* * * * *

2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes Western's and RUS's Federal actions and Basin Electric's proposed Project, including the proposed Project area, generating facility, and associated facilities. The chapter also describes alternatives to the proposed Project, including the No-Action Alternative, and discusses other alternatives considered but not evaluated in detail.

2.1 FEDERAL ACTIONS

2.1.1 Western's Federal Action

Western's proposed Federal action is to approve the interconnection request from Basin Electric. If the interconnection request is approved, Western would make the necessary modifications within the White Substation and any other system modifications or upgrades required to accommodate the interconnection. The interconnection would require the addition of an electrical transformer bay within the existing White Substation. The White Substation was constructed with space available to accommodate additional transformers on site to provide future electrical transmission in eastern South Dakota. No increase in the physical boundaries of the White Substation would be required. No other transmission system improvements are expected for this proposed Project. Western is not proposing alternatives because the Applicant's request to interconnect at White Substation limits Western to looking at that site alone. Other locations do not fit Western's or Basin's purpose and need.

Because Western's Federal action results from Basin Electric's interconnection request under Western's Tariff, which was developed to conform with applicable FERC Orders, Western is obligated to consider the Applicant's proposed Project as presented, and at the interconnection point designated by the Applicant, after first considering environmental effects under NEPA. Western's Federal action is limited to determining whether existing capacity is available on Western's transmission, system, whether the proposed interconnection would negatively affect power deliveries to existing customers, whether system upgrades or additions would be necessary to accommodate the interconnection, and whether operation of the transmission system would be adversely affected. Subject to its review under NEPA, if the proposed interconnection is compatible with all requirements, Western must approve the interconnection request. Western's Federal action also includes making any necessary upgrades or improvements at the Applicant's expense, and making any substation changes necessary to interconnect the applicant's proposed Project to the transmission system. In this case, no system upgrades or improvements are needed, and Western's Federal action only includes minor interconnection accommodations within the developed area of Western's existing White Substation. With the exception of the No Action Alternative, no reasonable alternatives to Western's Federal action exist, and none is analyzed in this EIS.

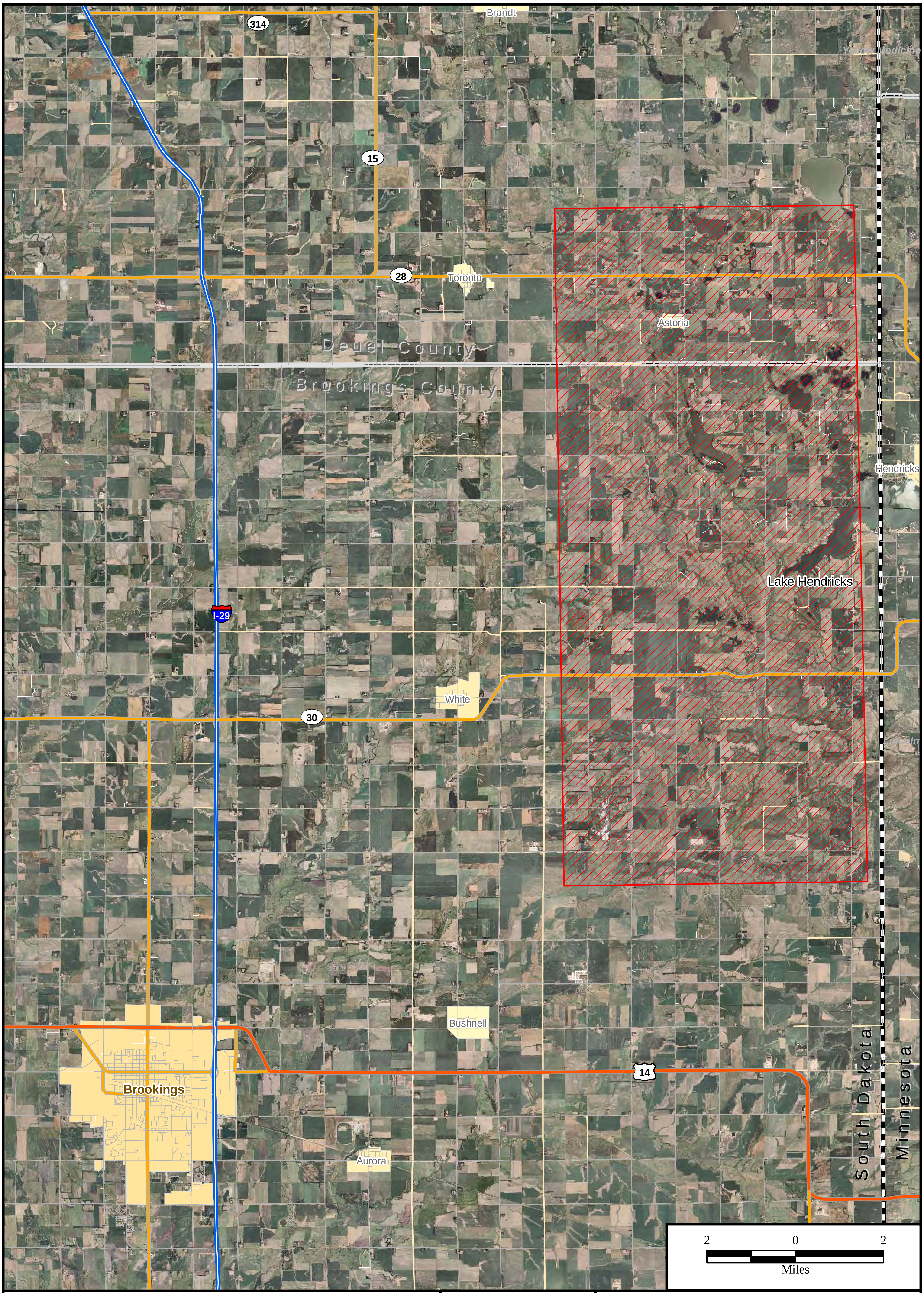
Western is not treating alternatives identified during Basin Electric's development of their proposed Project as alternatives to Western's federal action in the context of NEPA, but those alternatives are discussed within the body of this EIS (see section 2.1.2, 2.3, and 2.4). Western has the responsibility to disclose the environmental impacts of its proposed Federal action, and of Basin Electric's proposed Project, a goal that this EIS will accomplish.

2.1.2 RUS's Federal Action

RUS's Federal action is to approve or deny a request from Basin Electric to finance the construction and operation of the proposed Project. This decision is based on the review and approval of an Alternatives Evaluation and Site Selection Study (AE & SSS) in addition to the consideration of the Applicant's energy demand and transmission load forecasts and potential environmental impacts associated with the proposed Project. The Applicant has prepared an AE & SSS for RUS, which demonstrates the Applicant's purpose and need for the proposed Project and provides an analysis of alternatives evaluated in the Applicant's planning process (i.e., generation and transmission system design, facility siting, etc.). Because RUS includes the review and approval of the AE & SSS in its decision making process, alternatives documented in the AE & SSS, which are discussed in sections 2.3 to 2.4 of this DEIS, are considered NEPA alternatives for RUS and will be included in RUS's Record of Decision. RUS does have the discretion to provide financing for alternatives that may not be preferred by the Applicant, but are analyzed in this EIS.

2.2 PROPOSED PROJECT

Basin Electric is proposing to construct a 300-MW combined-cycle combustion turbine natural gas generation facility and supporting infrastructure in eastern South Dakota, approximately 14 miles northeast of the center of Brookings in Brookings County (figure 2-1). Combustion turbine generators (CTG) fueled by natural gas are used in both simple-cycle and combined-cycle configurations. In a simple-cycle configuration, gas turbines are used to power an electric generator without any recovery of heat from the exhaust gases. Gas turbine generators in a simple-cycle configuration are commonly used for peaking power applications during summer and winter months, when the demand is high for short periods of time.



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LEGEND

Study Area
Municipal Areas
County Boundary
State Boundary

Source: NAIP County Mosaic, Brookings and Deuel counties, North Dakota; ESRI

NORTH

Figure 2-1

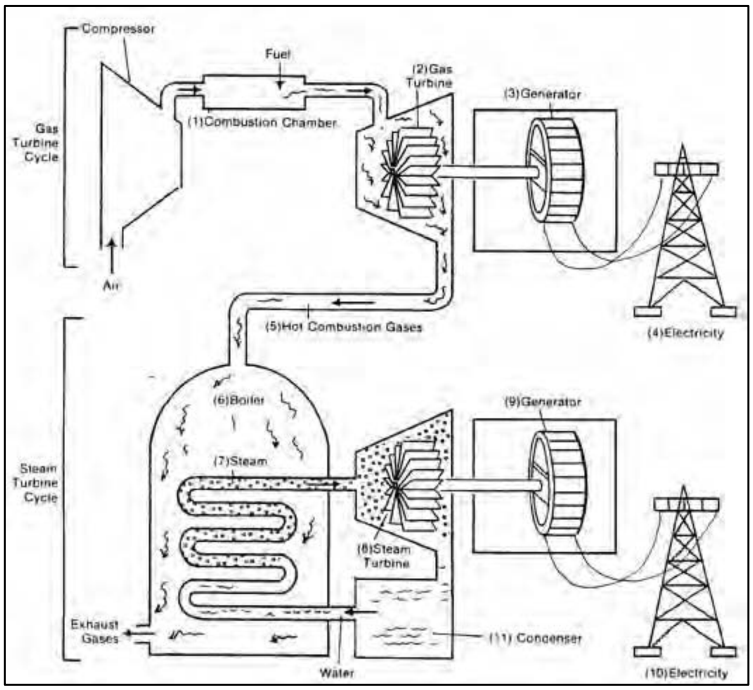
Study Area Location
Deer Creek Station EIS

Moody Pipestone

In a combined-cycle configuration, the exhaust from the CTG passes through a heat recovery steam generator (HRSG) that extracts waste heat from the turbine exhaust (figure 2-2). This waste heat is used to generate steam that then passes through a steam turbine generator.

The recovery of the waste heat greatly increases the efficiency of the unit in the combined-cycle configuration. Natural gas combined-cycle generators are commonly used in both intermediate and baseload power generation.

Figure 2-2: Typical Natural Gas Combined Cycle Process



Source: Arizona State University (2006)

To support the CTG, there would be water supply lines, natural gas supply lines and connection to electrical substation and transmission lines constructed in the vicinity of the proposed Project. A stormwater pond would be constructed to collect stormwater that drains from disturbed areas of the plant site. Water delivered from the groundwater supply would require treatment to improve its quality before it is used in the plant's steam cycle. Reject water from this process would be discharged as surface water after additional treatment to meet water quality standards. In addition, the road leading to the plant would be paved and key intersections will also be paved.

Two tanks of approximately 500 gallons each would be used on site to store diesel fuel for the emergency generator and fire pump. Ammonia tanks supporting the air pollution selective catalytic reduction (SCR) system and various water and wastewater storage tanks would be present. All tanks will be aboveground or in vault-type structures to minimize the potential for subsurface contamination. Additionally, there would be miscellaneous lubricants and hydraulic oils stored on site in appropriate storage areas. The remainder of this chapter examines alternatives Basin Electric considered in formulating their final proposed Project.

2.3 ENERGY ALTERNATIVES

Basin Electric's 2007 PSA provides a review of its current operating system, future load growth and the framework for future expansion, including both supply-side and demand-side resource expansion. Twelve resource expansion portfolios were created to meet the forecasted needs of Basin Electric and were evaluated with respect to cost, performance, and risk. All portfolios included some component of wind energy development. The twelve portfolios ranged from emphasizing nearly all baseload development to all peaking development, with various combinations in-between.

A number of demand-side and supply-side resource alternatives have been considered as a means of meeting the forecasted electrical need for Basin Electric identified in section 1.0. The alternatives evaluated include:

- Demand Side Management (DSM)
- Renewable Energy Sources
  - Wind
  - Solar
  - Hydroelectric
  - Geothermal
  - Biomass Power
  - Biogas
  - Municipal Solid Waste
- Fossil Fuel Generation
  - Simple Cycle Combustion Turbines
  - Combined-Cycle Combustion Turbines
  - Microturbines
  - Coal Facility
- Nuclear Power
- Repowering/Updating of Existing Generating Units
- Purchased Power / Request for Proposals (RFP)

- New Transmission Capacity

The most economical means of supplying power to a load that varies every hour on an electric power system is to have three basic types of generating assets available for use. These generation assets are commonly referred to as baseload, intermediate, and peaking capacity.

Baseload capacity runs at its full capacity continuously, day and night, throughout the year. The output of baseload-type plants cannot be rapidly decreased or increased to "follow load." Baseload units are designed to optimize the balance between high capital/installation cost and low fuel cost, resulting in the lowest overall production cost under the assumption that the unit will be heavily utilized for most of its life. Typically, baseload capacity units are operated around 80 percent capacity factor or more. Coal-fired power plants, nuclear plants, and hydroelectric plants are examples of baseload generation capacity; however, hydro plants that follow load are not considered baseload units.

Intermediate capacity units are designed to be cycled at low load periods, such as evening and weekends. The units are loaded up and down rapidly to handle the load swings of the system while the unit is online. Typically, intermediate capacity units are operated between a 20 and 80 percent capacity factor, or between baseload and peaking.

Peaking capacity is only operated during peak load periods and during emergencies. Very low capital/installation costs are important due to the fact these units are typically not operated very often. The operational costs are relatively high due to the high cost and volatility in the price of fuel. Types of peaking capacity power plants include combustion turbines, internal combustion engine plants, and pumped-storage hydroelectric facilities. Typically, peaking resources are operated under a 20 percent capacity factor.

Of the twelve resource expansion portfolios that would satisfy Basin Electric's needs over the next 12 years as analyzed in the PSA, the optimum portfolio included 300 MW of wind, 200 MW of peaking generation, 250 MW of intermediate generation and 600 MW of baseload coal generation. The Deer Creek Station is proposed to meet Basin Electric's projected intermediate generation requirement.

2.3.1 Demand Side Management

DSM is the process of managing the consumption of energy, generally to optimize available and planned generation resources. According to the DOE, DSM refers to actions taken on the customer's side of the meter to change the amount or timing of energy consumption. Utility DSM programs offer a variety of measures that can reduce energy consumption and consumer energy expenses. Electricity DSM strategies have the goal of maximizing end-use efficiency to avoid or postpone the construction of new generating plants.

DSM programs aim to achieve three broad objectives: energy conservation, energy efficiency, and load management. Energy conservation can reduce the overall consumption of electricity by reducing the need for heating, lighting, cooling, cooking energy and other uses. Energy efficiency can encourage consumers to use energy more efficiently, and thus get more out of each unit of electricity produced. Load management allows generation companies to better manage the timing of their consumers' energy use, and thus help reduce the large discrepancy between on peak and off-peak demand.

Approximately half of the Basin Electric members are utilizing load management to manage their power purchases from Basin Electric. Basin Electric has implemented a system-wide load management program on its eastern system, which enables Basin Electric to target large loads and/or generation that are not included in the members' load management programs to be used during Basin Electric's seasonal peak periods. Basin Electric has approximately 6-10 MW of load management available at this time.

DSM programs are capable of reducing the energy demand and reducing the required capacity of future additional generation facilities. It is apparent, however, that energy savings through DSM are not enough to alleviate the need for the intermediate resource fulfilled by the proposed Project.

2.3.2 Renewable Energy Resources

The renewable generation types capable of meeting an intermediate need of Basin Electric's would be the alternatives that have a capacity factor between 20 percent and 50 percent, which include wind, solar, and hydroelectric. Wind is an intermittent resource that cannot be scheduled when to operate, however it is low-cost when considering operating and maintenance costs due to the fact that there is no fuel cost. Wind would integrate very well with gas-fired generation because gas-fired generation can be shut down quickly during periods of wind generation, which offsets the fuel costs associated with gas-fired generation. Solar is also an intermittent resource that cannot be scheduled when to operate, and is very costly. Hydroelectric power generally operates between 40 and 50 percent capacity factor; however, it is very dependent on annual rainfall and therefore can go through some long periods of low generation. Currently, the upper Midwest has been experiencing several years of drought so water is limited. Other renewable forms of energy, such as geothermal, biomass power, biogas power, and municipal solid waste are typically used in a baseload generation mode and are most cost effective in this mode of operation. High temperature geothermal resources suitable for power generation are not available in eastern South Dakota (Geo-Heat Center 2008).

2.3.3 Fossil Fuel Generation

Of the four types of fossil fuel generation types listed in section 2.3, only the combined-cycle combustion turbine would provide the amount of power and flexibility to be used as an intermediate source of power. The simple cycle combustion turbines are small units that are used for peaking load capacity because of their quick start up capability, but are less efficient and more costly to operate than the combined-cycle system. As a new facility, the proposed Deer Creek Station would represent a state-of-the-art facility for natural gas combined-cycle combustion turbines. Microturbines are too small to provide the amount of power needed by Basin Electric for an intermediate generation source. Coal facilities are considered baseload operations because they are not capable of quick start up or shut down needed for an intermediate load facility.

2.3.4 Nuclear Power

Nuclear power is a baseload type of facility that is not capable of quick start up or shut down needed for an intermediate load facility.

2.3.5 Repowering/Uprating of Existing Generating Units

Basin Electric has completed upgrading the high pressure and intermediate pressure (HP/IP) turbine section of the main turbine at all three coal-fired units of the Laramie River Station. The Unit 2 upgrade occurred in the spring 2007 routine maintenance outage, Unit 3 upgrade occurred in the spring 2008 routine maintenance outage and Unit 1 upgrade occurred in the spring 2009 routine maintenance outage. The upgrade to the HP/IP turbine was anticipated to increase the net output of each unit by 8-12 MW for a total of 24-36 MW at the Laramie River Station. Each unit at the Laramie River Station has achieved at least the 12 MW increases, with two of the units increasing more than 12 MW. Basin Electric received 42.27 percent of this increased net output due to its 42.27 percent ownership share of the Missouri Basin Power Project (MBPP). Basin Electric has retrofitted the low-pressure (lp) turbine sections of Unit 2 in the Leland Olds Station. This upgrade increased the net output by 5.5 MW. These increases in net output are due to efficiency increases, without increasing the fuel input to the units.

While Basin Electric has made progress in upgrading existing facilities, it is apparent that the scale of the improvements does not alleviate the need for the intermediate resource fulfilled by the current proposal.

2.3.6 Purchased Power/Request for Proposals (RFP)

Basin Electric has signed a 25-year contract with the developer of the four current Recovered Energy Generation (REG) power plants, which are fueled by hot exhaust heat off the Northern Border Pipeline (NBPL), to purchase the output from four additional REG power plants. There will be one site each in

Montana and Minnesota, and two sites in North Dakota. These additional four sites should have a total combined output of 22 MW and are anticipated to be operational in 2009-2010. The generation is environmentally benign, using virtually no additional fuel and producing virtually zero emissions.

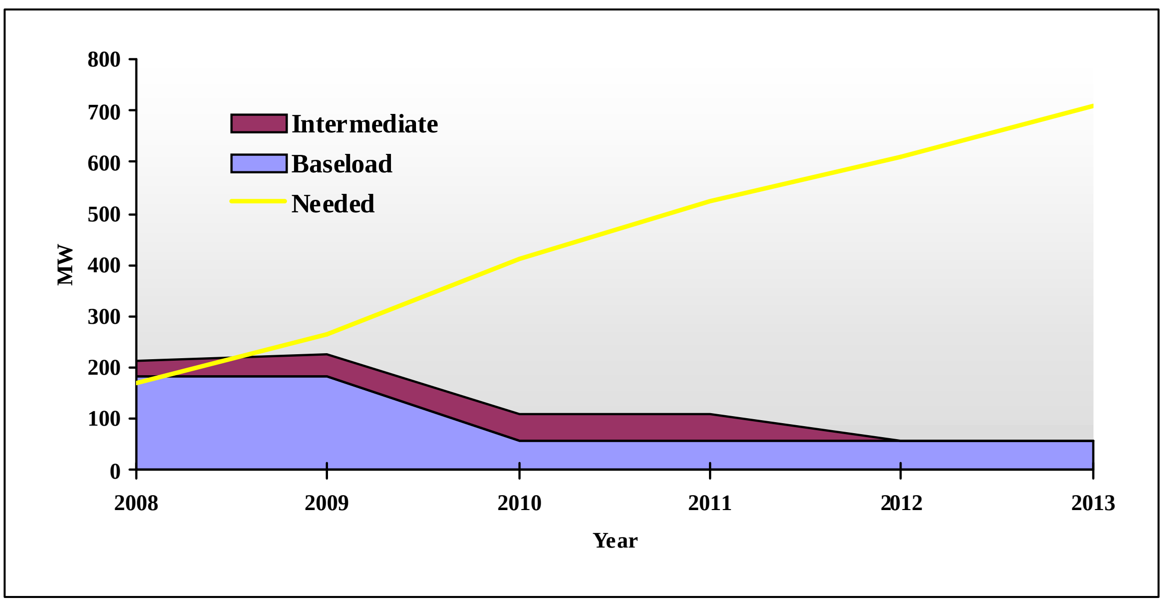
Basin Electric hired a contractor to develop and issue a RFP in early 2007 for short and long-term power supply on both its eastern and western system. The long-term proposals were used to evaluate against Basin Electric's self-build options. The short-term proposals could be utilized to meet some of Basin Electric's need in the next couple of years. Renewable proposals were also sought.

2.3.6.1 Short-term Proposals

Basin Electric received short-term proposals from nine different entities for power products located in both of Basin Electric's eastern and western systems. The short-term proposals were evaluated by the contractor.

Figure 2-3 compares Basin Electric's eastern system needed generation capacity to the magnitude of proposals received. From this information it was determined that Basin Electric could purchase the needed power from the market through 2009 but would need to develop additional resources to meet the needed obligations beyond 2009. Basin Electric did elect to short-list one proposal from the proposals received for delivery into Basin Electric's eastern system. It was determined that the short-term proposals were more costly than Basin Electric's self-build options.

Figure 2-3: Eastern System Short-Term RFP Proposals



2.3.6.2 Long-term Proposals

Basin Electric received four conventional long-term power purchase proposals from two different entities for either coal generation or a combination combined-cycle and simple cycle generation. These conventional long-term proposals were evaluated and it was determined that the four long-term proposals were more costly than Basin Electric's self-build options.

2.3.6.3 Renewable Proposals

Basin Electric received 12 proposals from nine different entities for wind generation to provide intermittent power. These 12 wind proposals were located in North Dakota, South Dakota, Montana, and Wyoming. Wind generation, however, is not an "on call" resource and, therefore, is not capable of fulfilling the purpose and need for an intermediate resource on its own.

2.3.7 New Transmission Capacity

Today there is limited available transmission capacity on the transmission system to move power into the Integrated System (IS) from Nebraska Public Power District (NPPD), Mid-American Energy Company (MEC), Midwest Independent Transmission System Operator (MISO) or Saskatchewan. In order to bring in enough power to cover Basin Electric's total need, additional transmission would need to be built and there would probably be upgrades needed to third-party transmission systems in order to move the power into the region.

The other question is whether there is existing generation outside the region to meet Basin Electric's need. The RFPs provided few responses for power outside the IS area during the short term: one proposal within MISO, one proposal within MEC, and one proposal from within NPPD. One proposal for a long-term output of a new coal plant was received that would result in either additional transmission to be built or additional wheeling expense to move the power into the IS, or both. Because of these anticipated higher costs, Basin Electric determined it would be a better economic decision to build the new generation within the IS and therefore avoid some unnecessary transmission costs to provide power to the membership at the lowest reasonable cost.

2.3.8 Summary of Energy Alternatives

For the reasons described above, neither DSM, renewables (excluding wind), fossil fuel baseload and peaking units, nuclear, repowering/uprating of existing units, project partnerships, purchased power, nor new transmission capacity would meet the need for the intermediate generation resource needed by Basin Electric because they were either technically not feasible within Basin Electric's eastern service territory, they were not economically the lowest cost option, or they were best operated not at an intermediate mode of generation and therefore did not meet the need for intermediate generation. Combined-cycle combustion turbines (CCCT) are an excellent source to meet Basin Electric's intermediate generating resource need both economically and technically. CCCTs do not tend to have a stable fuel cost; however, the fuel is generally available when needed. Wind is also a source for intermediate generation, although not always available on a consistent basis. Wind can be combined with gas generation, where wind reduces the need to operate gas-fired generation to produce energy. Through Basin Electric's resource expansion analysis, Basin Electric determined an amount of wind generation and CCCT generation that was most economical to meet Basin Electric's need. For this particular EIS, the proposed Project is the CCCT component that was determined economically and technically feasible to meet Basin Electric's purpose and need.

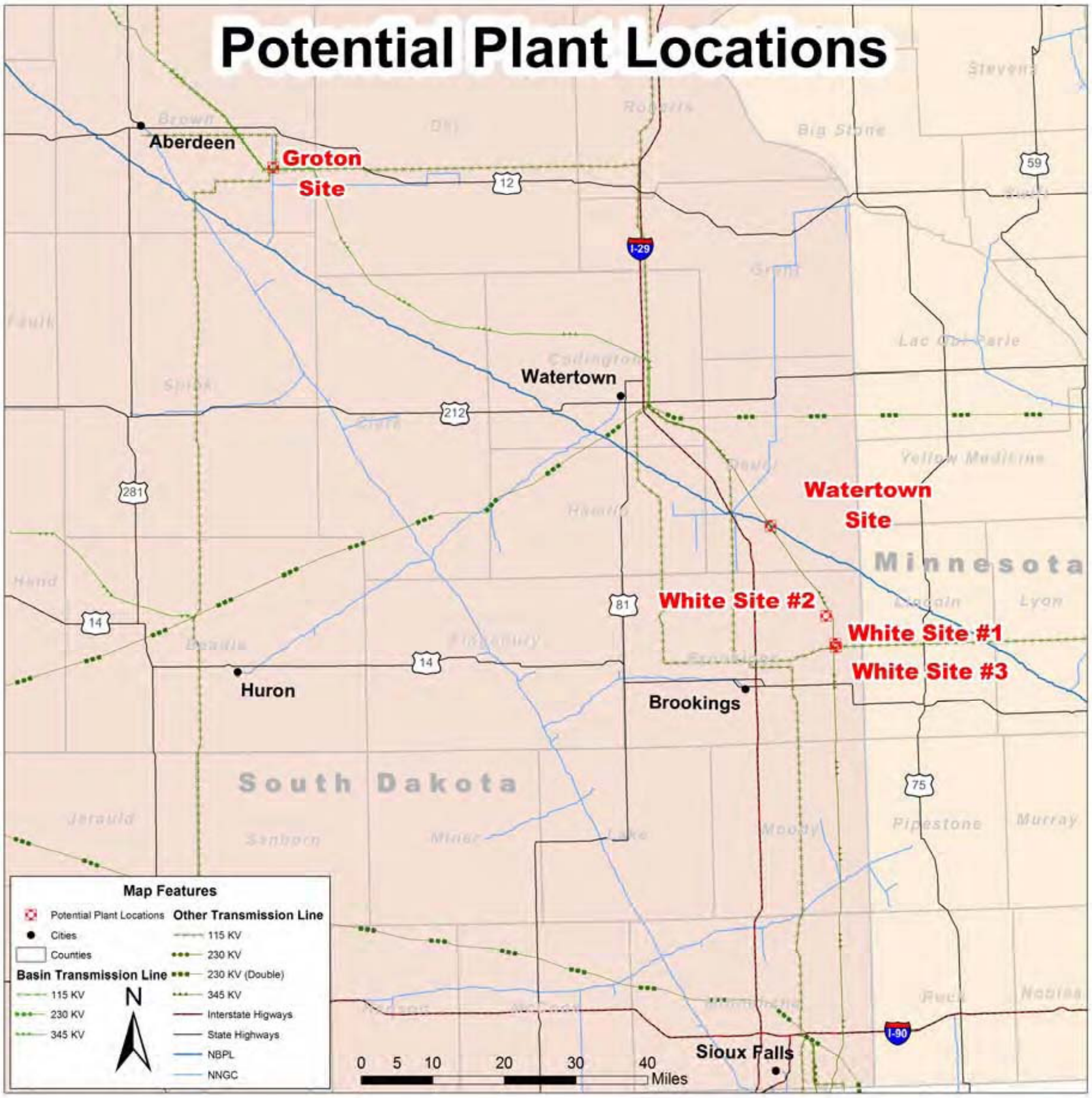
2.4 SITE ALTERNATIVES

Based on its PSA, Basin Electric has established the need for additional intermediate capacity to serve forecasted member load growth. Basin Electric has concluded that an intermediate resource located in eastern South Dakota is necessary to fulfill its member obligations. As discussed in the previous section, a CCCT facility appears to be the best alternative for Basin Electric's use as an intermediate resource. There were several factors considered in evaluating potential plant sites: access to a high-voltage transmission system with available capacity, natural gas fuel supply, water supply, existing land use and terrain, and proximity to residences.

Five potential plant sites (figure 2-4), located within Basin Electric's membership areas in eastern South Dakota, were initially identified as candidate sites that did not contain environmentally sensitive areas and had natural gas and transmission lines in the immediate vicinity. The Groton Site is located near Aberdeen, SD, the Watertown Site is about halfway between Watertown and Brookings, SD, and the White Sites 1, 2, and 3 are located near Brookings, SD.

Basin Electric staff completed an initial field review of these five sites in August and September 2007. The purpose of this site-screening field review was to verify the accuracy of databases used to locate existing natural gas pipelines, transmission lines and substations, and the spatial relationship of these resources to each other in the area surrounding the potential sites. Existing water supplies and transportation access were also identified. Potential environmental and human constraints in the area surrounding the potential sites were also noted. Regional air quality constraints, land use compatibility, geologic hazards, potential biological or cultural resource constraints, wetlands, and any potential for hazardous waste or spill sites in the general area were considered during this screening analysis.

Figure 2-4: Potential Plant Sites



Based on this initial field review, Basin Electric rejected three of the five potential sites from future consideration. The three sites rejected were the Groton Site, the Watertown Site, and White Site 3. The Groton Site was rejected due to property and transmission constraints associated with the previous installation of two simple-cycle peaking facilities. The Watertown Site was rejected due to the long distances to the nearest substation. White Site 3 was rejected because it is not large enough for a CCCT facility. The two sites that were suitable for further study following the initial screening were White Sites 1 and 2 (figure 2-5).

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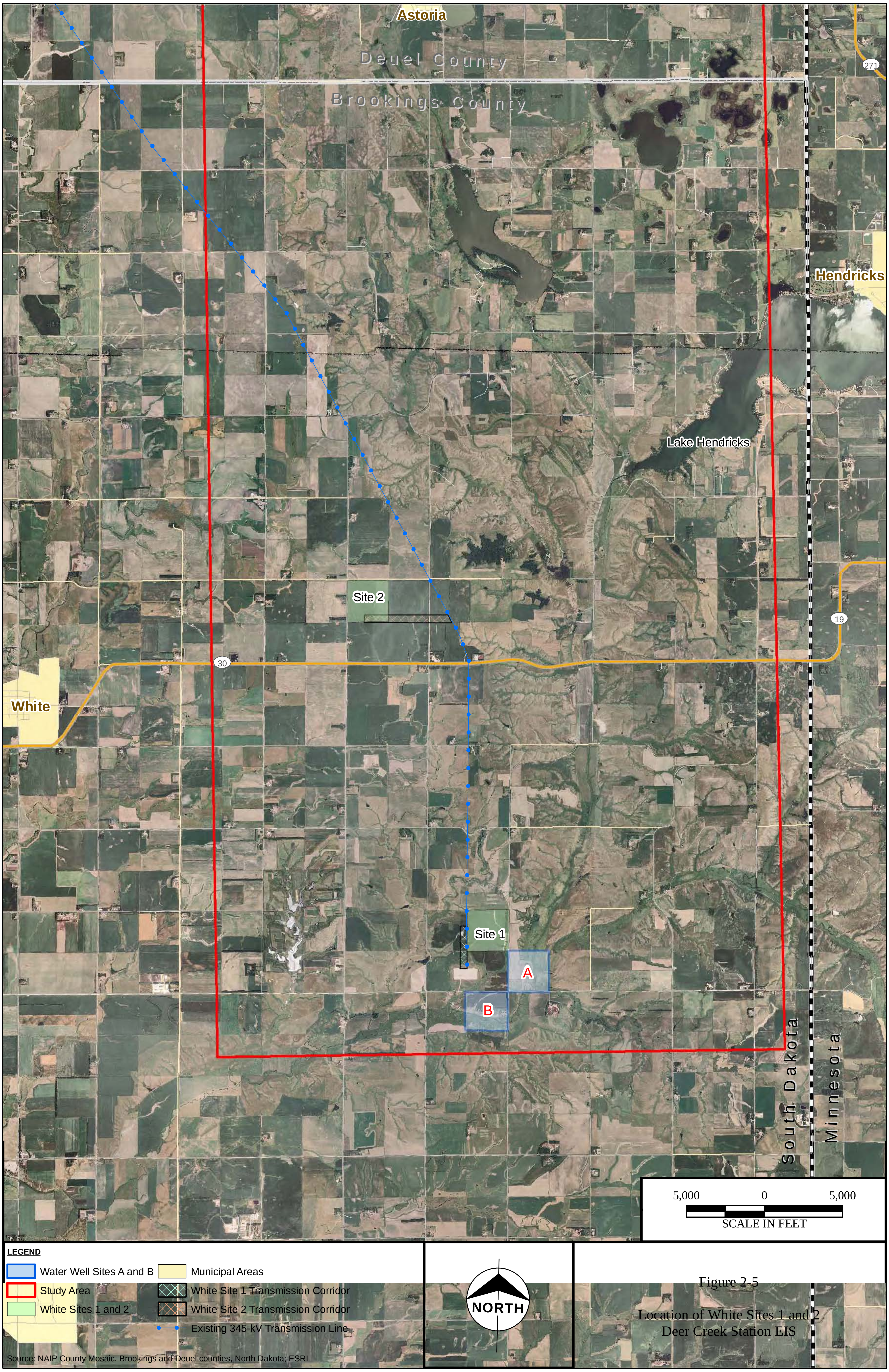

Figure 2-5

Location of White Sites 1 and 2
Deer Creek Station EIS

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2.4.1.1 Preliminary Site Analysis for Candidate Sites White Site 1 and 2

White Site 1 is located approximately 6 miles southeast of White, South Dakota, in the northeast quarter of Section 25, Township 111 North, Range 48 West, of the Fifth Principal Meridian, Brookings County. White Site 2 is located approximately 4 miles east-northeast of White, South Dakota, in the northwest quarter of Section 2, Township 111 North, Range 48 West, of the Fifth Principal Meridian, Brookings County.

2.4.1.1.1 Fuel Supply

The two sites under consideration (figure 2-6 and figure 2-7) are located near the NBPL, thus ensuring a reliable natural gas fuel source is available. Firm gas supply and transportation agreements are in place with the Dakota Gasification Company for delivery through the NBPL that meets Mid-Continent Area Power Pool (MAPP) accreditation requirements. The compressor station locations are also favorable because of existing aboveground pipeline taps. White Site 1 is located further from the NBPL than White Site 2; however, the rugged topography of the area near White Site 2 dictates that the pipeline to either site would be nearly the same length. As a result, neither site has an advantage over the other with respect to fuel supply. The initial potential natural gas pipeline routes are noted in figure 2-8 and the final proposed natural gas pipeline routes are identified in figure 2-9.

Figure 2-6: View Looking South from the North Boundary of White Site 1

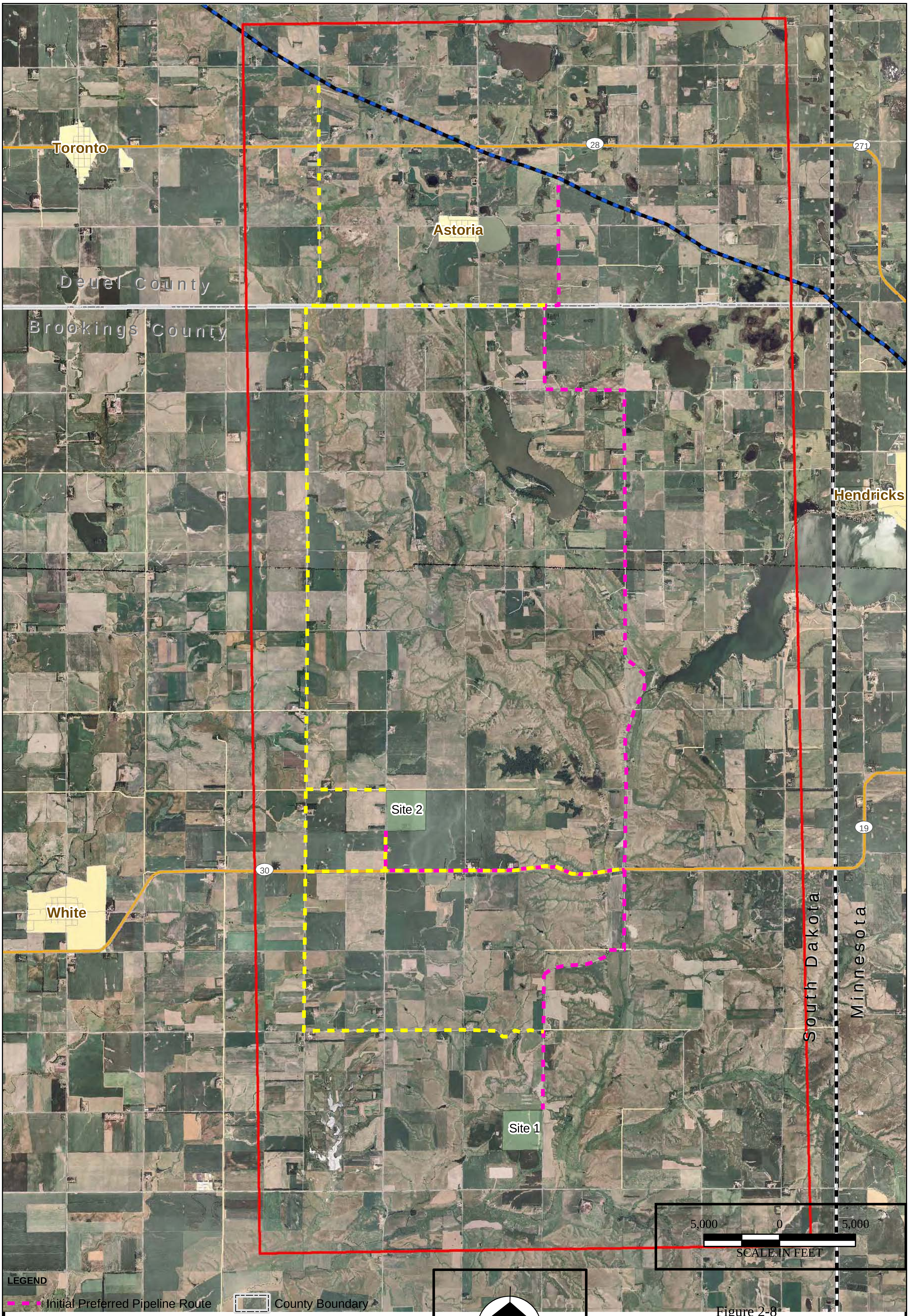
Figure 2-7: View Looking Southeast from the Northwest Corner of White Site 2

During the initial routing phase for the gas pipeline routes, several variations were identified to connect the alternate pipeline route from White Site 2 to the preferred pipeline route from White Site 1. Three variations were included that would allow crossover from the alternate route to the preferred route, and vice versa, at various points along the routes (figure 2-8). After initial evaluations, it was determined that the original preferred (from White Site 1) and alternate (from White Site 2) pipeline routes were sufficient and more practical from a constructability standpoint, and that the crossover segments were unnecessary. Therefore, these segments were removed from further consideration as part of the gas pipeline route alternatives. As part of final evaluation to determine proposed routes, field investigations were conducted by the proposed pipeline constructor, and they identified slight modifications of the proposed preferred routes. These are noted in figure 2-9.

2.4.1.1.2 Land Use/Terrain

The terrain in the White Site 1 study area is relatively flat and slopes from the northwest to the southeast; the area surrounding the site is well drained. The area under consideration for White Site 1 is agricultural, consisting primarily of farmland. The elevation of White Site 1 is approximately 1850 feet above mean sea level (msl). The terrain around the White Site 2 study area is very flat consisting primarily of farmland. The elevation of White Site 2 is approximately 1935 feet above msl.

Since both sites are relatively flat, neither site has an advantage over the other with respect to constructability. However, White Site 1 is preferred with respect to terrain because the slope of White Site 1 would allow better drainage than White Site 2. Both sites are currently used for agriculture. White Site 1 has approximately 1.60 acres of wetlands, while White Site 2 has 1.69 acres; however, the proposed Project would be configured to avoid wetlands to the extent practicable.



LEGEND

Initial Preferred Pipeline Route
Initial Alternate Pipeline Variations
White Site 1 and 2 Boundaries
Northern Border Pipeline
County Boundary
State Boundary
Study Area
Municipal Areas

Source: NAIP County Mosaic, Brookings and Deuel counties, North Dakota; ESRI

Figure 2-8

Initial Gas Pipeline Preferred and Alternate Routes
Deer Creek Station EIS

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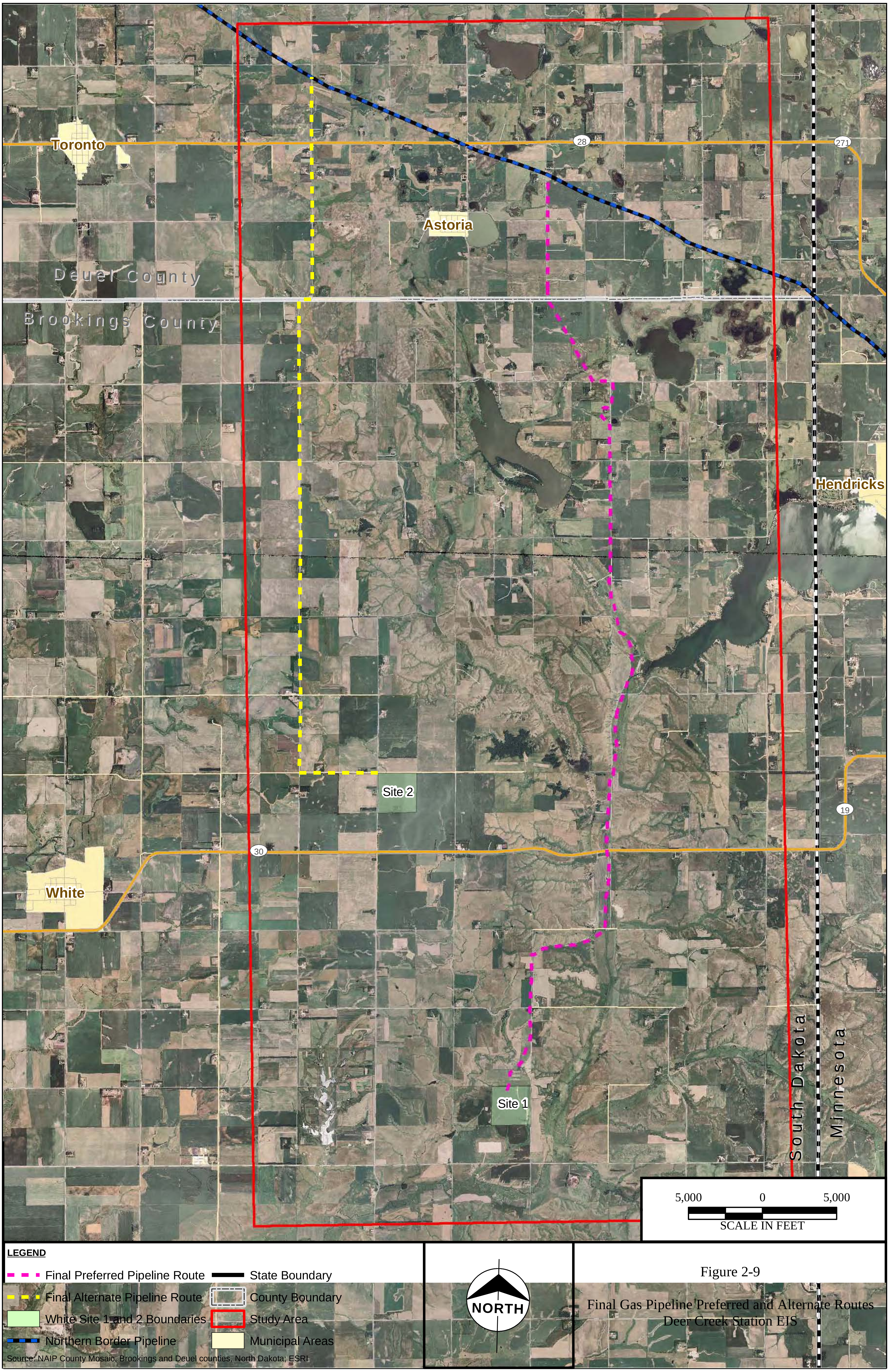

Figure 2-9

Final Gas Pipeline Preferred and Alternate Routes
Deer Creek Station EIS

2.4.1.1.3 Water Supply

Water usage for the proposed CCCT facility would be minimal because an air-cooled condenser would be used to condense the steam that exits the steam turbine, rather than a water-cooled condenser and cooling tower combination for this purpose. The facility would use water for control of nitrogen oxide (NO_x) emissions, evaporative cooling, and for make-up water for steam supply. A single-unit facility would normally consume 25 gallons of treated water per minute with a maximum of 60 gallons of treated water per minute. The facility is proposing to use groundwater as a source of water if a source is identified that meets quantity and quality criteria. Water provided by the existing rural water system would be pursued as an alternative. Currently, the exact location of a sufficient groundwater source for the sites remains undetermined; several test wells would be required to locate a source capable of delivering both sufficient water supply and properties to satisfy various station service water requirements. Two alternative sites were investigated as a water supply source for White Site 1. These are designated Water Well Sites A and B on figure 2-5. Water Well Supply Site A did not offer adequate pumping rates or aquifer recharge and therefore was not a feasible location. This left Water Well Supply Site B to be evaluated in detail in the EIS. For White Site 2, access to rural water supply infrastructure is readily available, and wells were not investigated. A one-mile rural water line extension along 202nd Street is included in the proposed action.

2.4.1.1.4 Transmission Access

Existing transmission in the vicinity of White Site 1 includes Western’s Watertown to White 345-kV line just west of the site. The existing 345/115-kV White Substation owned by Western is located approximately 0.5 mile southwest of the potential site. Western’s Split Rock to White 345-kV runs south of the White Substation. There are presently two 115-kV transmission lines (one owned by Western and one owned by East River Electric Power Cooperative) tied into this substation. A 345/115-kV substation owned by Xcel is located approximately 0.3 mile south of White Site 1. White Site 2 is located approximately 0.3 mile west of the same Western 345-kV line. Should White Site 2 be pursued a new 345-kV substation would be required at the plant and a double-circuit 345- kV transmission line would be required to tie into the existing Western 345-kV line at a point located approximately 0.75 miles east of the plant site. The proposed transmission line corridors are identified on figure 2-5.

The shorter transmission line associated with White Site 1 would cause less land to be disturbed by construction activities and would also be less costly due to fewer materials and less labor being required. White Site 2 would require an electrical substation to be built on site in order to get the power out of the site. White Site 1 would not require the construction of a new substation. As such, White Site 1 has a significant advantage over White Site 2 since it is much closer to the high-voltage transmission system.

2.4.1.1.5 Proximity to Residences

A facility on White Site 1 would be located approximately one mile away from the nearest occupied residence while on White Site 2 it would be located approximately 0.5 mile away from the nearest occupied residence. Therefore, White Site 1 has an advantage over White Site 2 because it is located farther away from the nearest occupied residence.

2.4.1.1.6 Site Selection Summary

Based on the evaluation criteria applied in the site selection process (access to a high voltage transmission system with available capacity, fuel supply, water supply, existing land use and terrain, and proximity to nearest occupied residences), White Site 1 has advantages over White Site 2. The terrain of White Site 1 allows for better drainage than White Site 2. The lower elevation of White Site 1 means that a gas turbine would perform marginally better at White Site 1 than at White Site 2. The relatively short distances to high voltage transmission facilities at White Site 1 would cause fewer disturbances of natural resources and be less costly because fewer materials and less labor would be required when compared to White Site 2. White Site 1 is also further away from the nearest occupied residence than White Site 2. For the reasons listed above, Basin Electric has selected White Site 1 as its Preferred Site.

2.5 NO ACTION ALTERNATIVE

Under the No Action Alternative, Western would not approve an interconnection agreement to its transmission system and RUS would not award a loan or loan guarantee to finance the construction and operation of the proposed Project. For the purpose of impact analysis and comparison in this EIS, it is assumed that Basin Electric's proposed Project would not be built and the environmental impacts, both positive and negative, associated with construction and operation would not occur. However, as Basin Electric is a utility obligated with load growth responsibility to its membership, it is reasonable to expect that it would construct a similar generation facility elsewhere in eastern South Dakota. For example, the facility could potentially interconnect with a non-Federal substation. Such a facility may not connect to a Federal transmission system, involve Federal financing, or have any other Federal nexus and, therefore, would not initiate a NEPA process. If Western were not to approve the interconnection agreement and RUS were not to award a loan or loan guarantee, the environmental impacts associated with the construction and operation of the proposed Project at this location would not occur. Basin Electric would have to find an alternate means to increase the intermediate generation demand for electric power in the eastern portion of its service area through some other project proposal, which would likely result in environmental impacts similar to, but potentially greatly different from, those identified for the proposed Project.

2.6 SUMMARY OF IMPACTS BY RESOURCE

Table 2-1 is a summary of construction and/or operational impacts associated with the proposed Project. Discussion of these impacts is found in chapter 4 of this EIS.

Table 2-1: Summary of Impacts

Resource	White Site 1	White Site 2	No Action Alternative
Air	Increase in emissions during construction from vehicles and equipment would be minimal for CO, NO_x, and VOC; particulates (dust) from site preparation and traffic on unpaved roads; all construction and operation emissions meet regulations; *de minimis* emissions of hazardous air pollutants (HAP); largest potential HAP is formaldehyde at 4.5 tpy		No impact
GHG Emissions	Not a major source of GHG emissions; estimated carbon dioxide (CO_2) emissions three one thousandths of one percent (0.00003) of global man-made emissions		No impact
Geology, Soils and Farmland	No unique geologic features; permanent prime farmland impacts of 40 acres of the 100 acre facility site (60 acres still available for hay or pasture); loss of 1 acre at water well supply site	No unique geologic features; permanent prime farmland impacts of 46 acres of the 100 acre site (54 acres still available for hay or pasture)	No impact
Water Quality	Potential sedimentation from site preparation, pipeline construction, transmission line construction, road improvements, and water line construction. No disturbance of pre-existing contamination; some use of hazardous chemicals on site	Potential sedimentation from site preparation, pipeline construction, transmission line construction, substation construction, and water line construction. No disturbance of pre-existing contamination; some use of hazardous chemicals on site	No impact
Floodplains	No floodplains on facility site; water well located in Deer Creek floodplain; pipeline construction crosses floodplains	No floodplains on facility site; pipeline construction crosses floodplains	No impact
Groundwater	Pumping of six million gallons per year or 18 acre-feet from Big Sioux aquifer for cooling water; crossing by natural gas pipeline of Zone B Well Head Protection Areas (29,262 linear feet)	Six million gallons per year of water would be obtained from municipal water supply, which is obtained from Big Sioux aquifer. Crossing by natural gas pipeline of Zone A Well Head Protection Area (805 linear feet) and Zone B (8,033 linear feet)	No impact

Resource	White Site 1	White Site 2	No Action Alternative
Wetlands and Streams	Based on National Wetland Inventory (NWI), impacts of 0.0 acres on facility site, 0.0 acres for transmission line corridor, 0.0 acres for water pipeline corridor; temporary impacts of 1.75 acres in natural gas pipeline corridor; delineated wetlands of 3.2 acres on facility site, to be avoided to the extent practicable; delineated temporary impacts of 6.6 acres in natural gas pipeline corridor, 2.5 acres in water pipeline corridor, and 0.2 acres in transmission line corridor; some high quality prairie potholes crossed	Based on NWI, wetland impacts of 0.02 acres on facility site and 0.21 acres for substation; temporary impacts of 1.70 acres for transmission line corridor, 0.05 acres in rural water pipeline corridor and 0.61 acres in natural gas pipeline corridor; some high quality prairie potholes crossed	No impact
Vegetation	Existing site is cultivated cropland; a 100-foot wide corridor would be cut through existing narrow forested shelterbelt along eastern edge of the site for waterline and access road; natural gas pipeline is 47 percent cultivated cropland and 34 percent pasture; distance through native prairie is 2,620 linear feet	Existing site is cultivated cropland; woodland on site would be avoided; natural gas pipeline is 55 percent pasture and 40 percent cultivated cropland, and 5 percent forested shelterbelt; no native prairie impacts	No impact
Wildlife	Minimal impacts; generation facility would be near inactive raptor nests and great horned owl nest; transmission line of 0.75 mile poses some collision risk to avian species	Minimal impacts; transmission line of 0.50 mile poses some collision risk to avian species	No impact
Special Status Species	Topeka shiner habitat in nearby Deer Creek and tributaries would not be impacted; also suitable habitat for Dakota skipper	Suitable habitat for Dakota skipper	No impact

Resource	White Site 1	White Site 2	No Action Alternative
Socioeconomics	360 temporary construction workers and 30 permanent employees; local government services adequate for worker influx; positive benefits from property taxes and right-of-way (ROW) easements		No impact
Environmental Justice	No impact	No impact	No impact
Land Use	115 acres needed (75 acres of site still available for agricultural uses); new 13.2-mile pipeline ROW (all still available for agricultural uses)	109 acres converted to utility uses (63 acres still available for agricultural uses); new 10-mile pipeline ROW (all still available for agricultural uses)	No impact
Transportation	No adverse level of service impacts; roadways to be paved at intersections and near plant site; heavy haul temporary bridge over Deer Creek	No adverse level of service impacts; roadways to be paved near plant site	No impact
Visual	Project visible for up to four miles but would mix in with wind turbine views	Project visible for up to four miles; highly visible from SD 30; would mix in with wind turbine views; new substation would be additional new visual intrusion	No impact
Noise	Construction noise impacts; short term steam blow event; operational impacts within HUD guidelines	Construction noise impacts; short term steam blow event; operational impacts within HUD guidelines	No impact
Public Health and Safety	Conformance to all OSHA safety procedures for plant workers; minor general public impacts from increased traffic		No impact
Intentional Destruction	Minor security issues		No impact
Cultural Resources	No impacts to National Register of Historic Places (NRHP) eligible properties	Potentially NRHP-eligible sites on natural gas pipeline route	No impact
Recreation	Temporary impact to one Walk-in Area WIA (State hunting lease area) during pipeline construction	No impacts to public lands or hunting lease areas	No impact

* * * * *

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3.0 AFFECTED ENVIRONMENT

The affected environment is the physical area in which resources could be impacted by Western's and RUS's Federal actions and the construction, operation, and maintenance of Basin Electric’s proposed Project. The boundaries of the region analyzed may vary depending on the resource. Because both sites are located in the same county and involve similar environmental resources, most statements generally describing the study area (figure 2-1) apply to both sites. This EIS addresses the requirements of all applicable laws and regulations including the requirements of section 102(2) of NEPA, the CEQ Regulations implementing the Procedural Provisions of NEPA (40 CFR parts 1500-1508), DOE NEPA Implementing Procedures (10 CFR part 1021), RUS Environmental Policies and Procedures (7 CFR part 1794, as amended), DOE regulations for Compliance with Floodplain and Wetland Environmental Review Requirements (10 CFR part 1022), and other applicable laws, regulations, and Executive Orders (EOs), including, but not limited to, the following:

- ESA, section 7
- Farmland Protection Policy Act
- MBTA
- NHPA, section 106
- EO 11988 (Floodplain Management)
- EO 11990 (Protection of Wetlands)
- EO 12898 (Environmental Justice)
- EO 13007 (Indian Sacred Sites)
- EO 13045 (Protection of Children from Environmental Health Risks and Safety Risks)
- EO 13112 (Invasive Species)
- EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds)

Where applicable, this EIS also identifies additional permits and approvals that may be needed under other environmental laws, including the CWA and Safe Drinking Water Act. No Federal land is needed for the two alternative plant sites, natural gas pipeline route alternatives, water supply wells, or water pipeline extension. Termination of the transmission line would be the White Substation, a federally owned facility.

Based on scoping and proposed Project characteristics, the following resources could potentially be impacted:

- Air Resources, including GHG emissions and climate change
- Geological Resources, including prime, unique, and important farmland
- Water Resources, including surface water, wetlands, floodplains, and groundwater
- Biological Resources, including vegetation, wildlife, and endangered and threatened species
- Socioeconomic Resources, including environmental justice and protection of children
- Land Use
- Recreation
- Transportation
- Visual Resources
- Noise
- Public Health and Safety, including intentional acts of destruction
- Cultural Resources, including Indian Sacred Sites and historic properties

For air resources and socioeconomic resources, the area assessed includes the county affected and adjacent counties (Brookings, Moody, Deuel, Lake, Kingsbury, and Hamlin SD, and Lincoln MN).

For aquatic resources, the area assessed includes the Lac Qui Parle River watershed upstream of Lake Hendricks, the poorly defined drainages in the vicinity of Oak Lake and Astoria Lake, and the Deer Creek and Six Mile Creek watersheds.

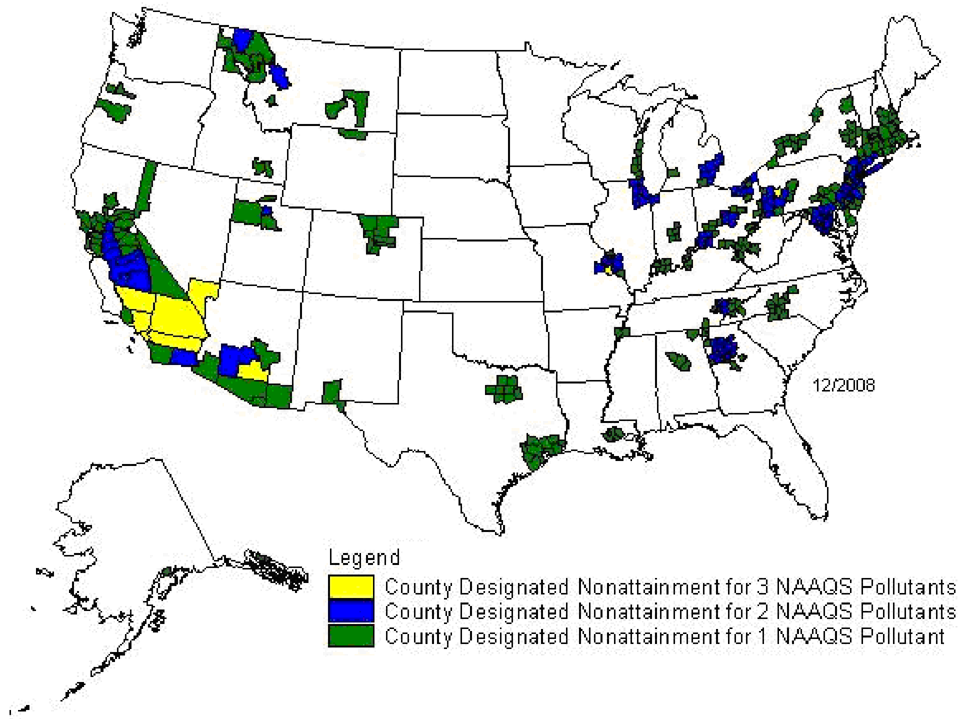
For terrestrial resources, the area assessed includes the ecoregion where the facilities are to be located. Ecoregions denote areas of general similarity in the type, quality, and quantity of environmental resources. According to the EPA, the proposed Project area is within the Northern Glaciated Plains, Big Sioux Basin ecoregion. The alternative pipeline routes extend into the Northern Glaciated Plains, Prairie Coteau ecoregion, in the area around Oak Lake and Lake Hendricks. The natural vegetation of both ecoregions is described as the tallgrass-shortgrass prairie transition (Bryce et al. 1998).

3.1 AIR RESOURCES

3.1.1 Air Quality Standards

All counties in South Dakota are currently in attainment for all National Ambient Air Quality Standards (NAAQS). (figure 3-1).

Figure 3-1: Counties Designated "Nonattainment" for NAAQS



Source: Environmental Protection Agency 2009b.

One air-monitoring site is operated in Brookings, located at the City Hall building in the center of the city. The area to the west of the site is residential and the areas north, east, and south have service-oriented businesses and light industry. Both PM_{10} and $PM_{2.5}$ are monitored at this location (AQS ID Number 46-011-0002).

PM_{10} sampling began at this site in 1989. The annual averages range from a high of 38 $\mu g/m^3$ in 1990 to a low of 17 $\mu g/m^3$ in 1993, compared to the annual standard of 50 $\mu g/m^3$. The trend shows concentration levels declining over the 19 years the site has been operating. In 2007, PM_{10} concentrations were up slightly from the previous year but still well below the highest concentration in 1990 (SDDENR 2008a). The reasons for the decline in particulates are unknown, but the decline may be related to the near-normal moisture levels in the eastern part of South Dakota in recent years.

3.1.2 Greenhouse Gases and Climate Change

Climate change refers to changes in the long-term trends of many climatic factors such as temperature, precipitation, or wind. There continues to be a degree of uncertainty surrounding the contemporary causes of climate change, and the importance of those changes. Climate change may be the result of:

- Natural factors such as solar and orbital variations

- Natural processes and cycles within the climate system (e.g., ocean circulation changes)
- Human activities that change the atmosphere's composition (e.g., land use changes, burning fossil fuels) and the land surface

A large number of scientists believe that global warming is occurring and causing climate change. They also believe greenhouse gases (GHGs) are major contributors to global warming and climate change. Assessments by the Intergovernmental Panel on Climate Change (IPCC) suggest that the Earth's climate has warmed between 0.6 and 0.9 degrees Celsius over the past century and that human activity affecting the atmosphere is "very likely" an important driving factor. According to the IPCC, "very likely" indicates that there is a 90 percent chance that this is the case. In the IPCC Fourth Assessment Report (IPCC 2007), scientists conclude that "most of the observed increase in globally-averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations." The IPCC goes on to state, "The observed widespread warming of the atmosphere and ocean, together with ice mass loss, support the conclusion that it is extremely unlikely that global climate change of the past 50 years can be explained without external forcing, and very likely that it is not due to known natural causes alone."

GHGs are gases that trap heat in the earth's atmosphere by absorbing and re-emitting solar radiation. GHGs such as water vapor and CO_2 occur naturally and are emitted to the atmosphere through natural processes and human activities. The IPCC estimates that water vapor is responsible for 60 to 80 percent of the world's greenhouse effect. Other GHGs such as fluorocarbons are created and emitted solely through human activities. The principal GHGs are CO_2, methane (CH_4), nitrous oxide (N_2O), and fluorocarbon gases (EPA 2009a).

CO_2 enters the atmosphere through the burning of solid waste, wood, and fossil fuels (oil, natural gas, and coal), and also as a result of other chemical reactions (e.g., manufacture of cement). Most CO_2 that is naturally produced through respiration and decomposition is taken up by photosynthesis of plants on land and in the oceans. CO_2 emitted by combustion of fossil fuels and industrial processes is causing CO_2 concentrations to increase in the atmosphere (IPCC 2007). CO_2 accounts for approximately 70 percent of global man-made GHG emissions (EPA 2006).

CH_4 is emitted during the production and transport of coal, natural gas, and oil; CH_4 is also emitted from livestock, agricultural processes, and organic waste decay and amounts to about 24 billion metric tons annually in the U.S. Natural CH_4 emissions globally are from wetlands, oceans, hydrates, and fires. CH_4 accounts for approximately 15 percent of global man-made GHG emissions (EPA 2006).

N_2Os are emitted during the combustion of fossil fuels and solid wastes, as well as during agricultural and industrial activities. N_2O accounts for approximately eight percent of global man-made GHG emissions (EPA 2006).

Fluorocarbon gases such as perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride are emitted from a variety of industrial processes. They are seven percent of global GHG emissions. They are not naturally produced (EPA 2006).

3.2 GEOLOGY, SOILS AND FARMLAND

3.2.1 Glacial Geology

The entire area affected by the proposed Project was glaciated. However, during the last glaciation (Wisconsin), glaciers parted around both sides of the Big Sioux Basin. The river developed when glacial meltwater flowed southward between the two glacial lobes. This led to a better-developed drainage network, fewer wetlands, and less topographic relief. The Prairie Coteau is an area of outwash built up at the edge of the ice sheet under the two glacial lobes. The Prairie Coteau is a plateau approximately 200 miles in length and 100 miles in width, rising above the prairie flatlands in South Dakota and Minnesota. It is comprised of thick glacial deposits, reaching a thickness of approximately 900 feet. Pierre Shale of Cretaceous age (rocks dating from 145 to 65 million years in age) underlies the till in most of the area (Bryce et al. 1998). The shale is enriched in selenium and other trace elements (Leibbrand 1985). Precambrian rocks (with ages greater than 570 million years in age) occur at still deeper levels (Bryce et al. 1998). Granite is quarried at Milbank, South Dakota, and outcrops of Sioux Quartzite are common. Layers of silt in the quartzite near Pipestone, Minnesota, to the southeast of the proposed Project, were quarried by Native Americans, and the stone was carved for pipe bowls. Within the proposed Project area, there are no substantial mineral resources. Sand and gravel deposits exist within pockets which have been utilized for construction and road base and concrete aggregates (Martin et. al. 2004).

3.2.2 Soils and Agriculture

The dominant soil order in this area is Mollisols, which developed under grassland vegetation, and tends to be classified as prime farmland. The soils in the area have a soil temperature regime reflecting their northern location, a soil moisture regime reflecting a moist climate, and mixed mineralogy (USDA NRCS 2006). They generally are very deep, well drained to very poorly drained, and loamy. The soils in the proposed Project area are comprised of three main groups based on their geological history: loess (wind-blown sediment derived from finely ground rocks associated with glaciers) which lies on the ridge-tops, residual material that formed in glacial plains and moraines, and alluvial material that lies in stream terraces and glacial outwash plains. The majority of the soil types in the proposed Project area of Brookings and Deuel counties are hydric, meaning that they contain standing water or are saturated most of the year; the hydric soils are associated with swales/potholes, floodplains, and outwashes. However, these soil types also contain drier areas and are extensively used for agriculture.

More than two-thirds of the proposed Project area in Brookings and Deuel counties is in farm production. Major soil resource concerns are wind erosion, water erosion, maintenance of the content of organic matter and productivity of the soils, soil wetness, and management of soil moisture. Conservation practices on cropland generally include systems of crop residue management, especially no-till or other conservation tillage systems that conserve moisture and contribute to soil quality. Other practices include terraces, vegetative wind barriers, grass waterways, and nutrient management (Brady and Weil 1996).

3.2.3 Farmland

Prime farmland, as defined by the USDA, is land that has been determined to have the best combination of physical and chemical properties for agricultural production and is available for farming (USDA NRCS 2009). In addition to prime farmland, land may be classified as unique farmland, which is used for the production of specific high value food or fiber crops, and farmland of statewide or local importance, as determined by the State or local jurisdiction.

In Brookings County, 51 soils are classified as prime farmland, 18 soils are prime farmland if drained, five soils are prime farmland if irrigated, and 18 soils are classified as farmland of statewide importance. In Deuel County, 40 soils are listed as prime farmland, 11 soils are prime farmland if drained, three soils are prime farmland if irrigated, and seven soils are classified as farmland of statewide importance.

In the portion of the proposed Project area within Brookings County, 44 of the soils found in this area are listed as prime or statewide important farmland. In the portion of the proposed Project area within Deuel County, there are 39 soils classified as prime or statewide important farmland. These soils account for approximately 60 percent of the entire proposed Project area.

3.3 WATER RESOURCES

3.3.1 Surface Water

Most of the proposed Project facilities for White Site 1 or White Site 2 would be located within the Big Sioux River basin. However, the northern-most portions of the proposed natural gas pipeline routes are within the Minnesota River Basin. Surface waters located within and adjacent to the proposed Project facilities include Lac Qui Parle River, Deer Creek, Six Mile Creek, Lake Hendricks, Oak Lake, isolated wetlands, and numerous unnamed intermittent and ephemeral stream tributaries. There are two waterways designated as Deer Creek in the proposed Project area, one flowing north to Lake Hendricks and one flowing southwest toward the Big Sioux River.

Lac Qui Parle River flows into Lake Hendricks, located just east of the White Site 1 Natural Gas Pipeline Route. Lac Qui Parle River then flows northeast into the Minnesota River. Other small streams in the northern portion of both pipeline routes are also tributaries to the Lac Qui Parle River. Deer Creek and its tributaries generally flow south along the proposed White Site 1 Natural Gas Pipeline Route and turn in a southwesterly direction south of White Substation. Six Mile Creek generally flows southwest and is located to the west of the proposed Project. Both Deer Creek and Six Mile Creek are tributaries to the Big Sioux River. Oak Lake is a very large prairie pothole, located southwest of the northern portion of the proposed White Site 1 Natural Gas Pipeline Route. It does not have a surface drainage outlet.

All drainages within the proposed Project area are on privately owned lands. These lands have been impacted by agricultural use, including grazing, haying, and tilling.

As required under section 303(d) of the Federal CWA, the SDDENR has identified and created a list of impaired water bodies that require the development of Total Maximum Daily Limits (TMDLs). A TMDL is the amount of pollution a water body can receive and still maintain water quality standards established by the U.S. EPA. The main causes of impairment within the Big Sioux River basin are fecal coliform, mostly from livestock operations and municipal sewage, and total suspended solids, mostly from cropland and streambank erosion. Lakes within the Big Sioux Basin are eutrophic due to algae, nutrient enrichment, and siltation. Most prairie pothole lakes and wetlands are undergoing a natural process of gradually turning into marshes and eventually into dry land, as vegetation production and natural inputs of dust and sediment eventually displace the water features. Lakes in the Big Sioux Basin which are impaired include School Lake in Deuel County and West Oakwood Lake in Brookings County. Streams in the Big Sioux Basin that are listed as impaired include North Deer Creek, located to the west of I-29; and Spring Creek, located in southeastern Brookings County. Six Mile Creek, Deer Creek, and Medary Creek, which drain the proposed Project area, are unassessed.

The pipelines proposed to serve the alternative plant sites also enter the Minnesota River drainage. Lake Hendricks, located east of the White Site 1 Natural Gas Pipeline Route, is on the 303(d) list because it had a Trophic Scale Index (TSI) value that was higher than the assigned numeric standard for a warm water, semi-permanent fishery. TSI values quantify productivity based on algal biomass (SDDENR 2008b).

Water quality in Lake Hendricks has deteriorated due to nutrient and sediment loading. The Brookings County Conservation District works with landowners to install field windbreaks, shelterbelts, filter strips, cattle rock crossings, and riparian buffers. In addition, cattle access to Lake Hendricks has been reduced by fencing (BCD 2002).

3.3.2 Floodplains

Both Brookings and Deuel Counties participate in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program, which allows residents to purchase special insurance at subsidized rates, although only Brookings County enforces the Flood Damage Prevention Ordinance. This ordinance puts specific restrictions on construction in floodplains. There are no designated 100-year flood plains in the rural areas of Deuel County. Within the proposed Project area in Brookings County, designated floodplains are along Deer Creek and Six Mile Creek (tributaries to Big Sioux River) and along the other stream designated as Deer Creek that flows into Lake Hendricks and the Lac Qui Parle River). These streams have wide floodplains due to the lack of time to develop meanders, as the streams are relatively younger than the streams they flow into, e.g. the Big Sioux River, and have overall less stream flow. The floodplains of Deer Creek and Six Mile Creek are generally hundreds of feet in width. The water well supply sites are located within the Deer Creek floodplain. The designated floodplains in the vicinity of White Site 1 and White Site 2 are delineated on figure 3-2.

3.3.3 Groundwater

The main source of groundwater occurring in Brookings County is that of the Big Sioux Aquifer. Most of the public water supply in this area comes from the Big Sioux Aquifer (BCPC 2000). Sediments and soils that overlie the Big Sioux aquifer are thin and very permeable, which means that the aquifer is susceptible to contamination from the land surface. In some locations, the groundwater from this aquifer is not suitable for human use because of high nitrate concentrations due to human or agricultural sewage. Other chemical substances present at levels considered high for drinking water are iron, manganese, and sulfate. However, the water is usually good in quality for other uses. The best water quality in the aquifer occurs where it is thickest and the potential to dilute pollutants is greatest, including in Brookings County (Liebbrand 1985).

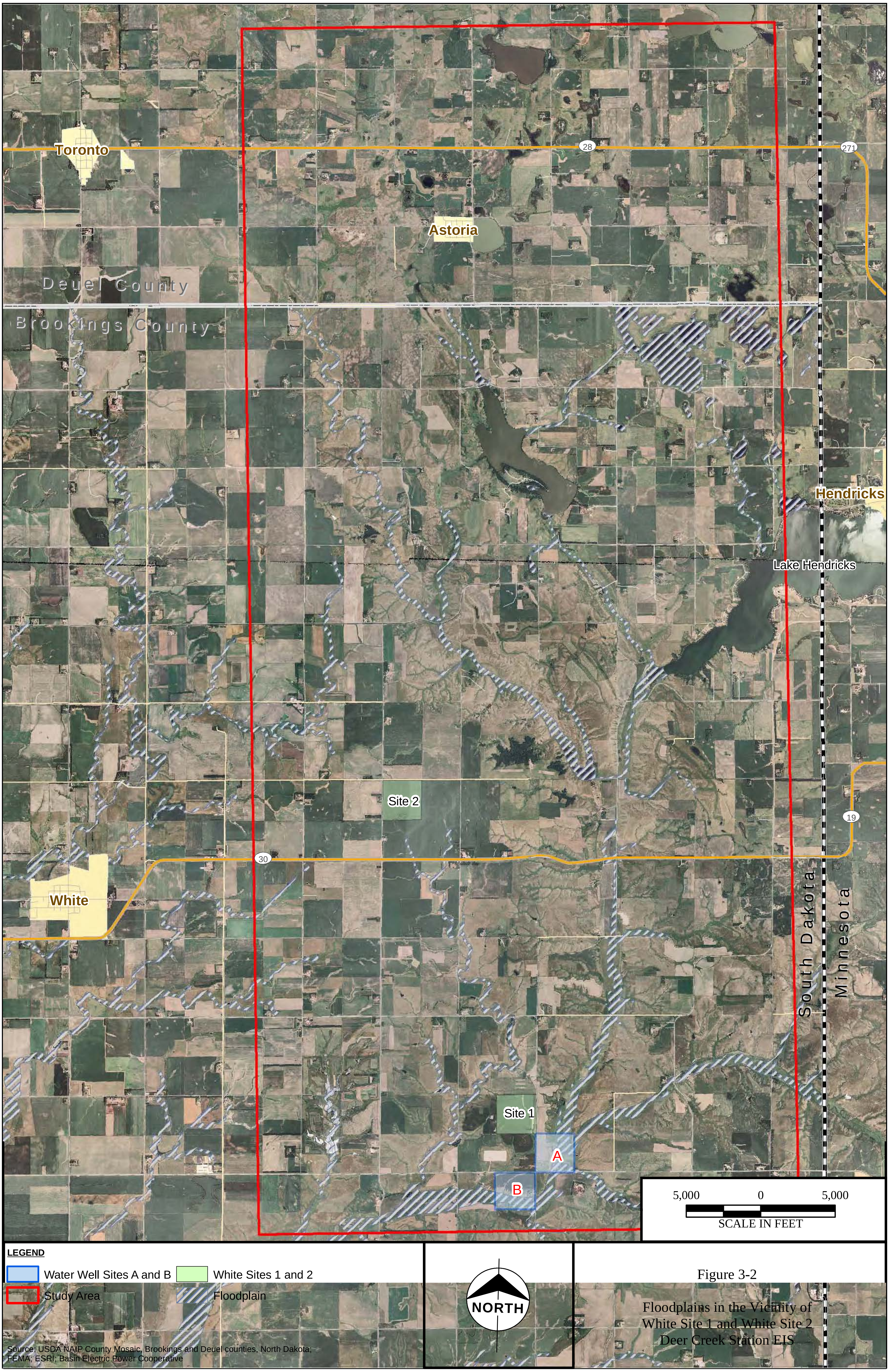


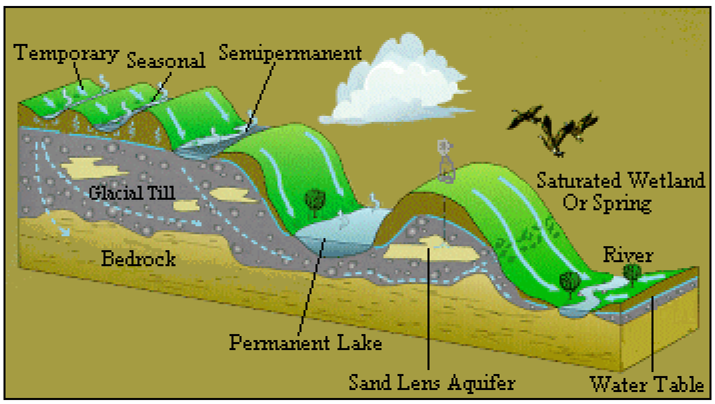
Figure 3-2

Floodplains in the Vicinity of White Site 1 and White Site 2
Deer Creek Station EIS

\\espsrv\data\projects\Basin\Basin\51236_EIS\GIS\DataFiles\ArcDocs\Revised_Figures_11_19_09\Figure 3-2_11_19_09.mxd Revised: 11/19/2009

Other groundwater can be found within the proposed Project area below streams and bodies of water, such as Lac Qui Parle River, Deer Creek, Six Mile Creek, Lake Hendricks, and Oak Lake. The water from these sources seeps down into the underlying sediment, which are glacial drift formations and deposits of outwash composed of sand and gravel. The groundwater in these aquifers is generally shallow at less than fifty feet from the surface (DCPC 2004a). The aquifers are complex, consisting of many small aquifers that are hydrologically associated with several large aquifers and the Big Sioux River. Yields in some areas are not reliable. For most uses, the water in these aquifers is of acceptable quality. However, in some locations, there are high nitrate concentrations due to livestock waste seepage into the water table (Amundson and Koch 1985; Leibbrand 1985). The complex pattern of hydrology in the prairie pothole region is illustrated in figure 3-3.

Figure 3-3: Hydrology of the Prairie Pothole Region



(Source: Johnson et al. 1997)

Eleven counties in eastern South Dakota, including Brookings and Deuel Counties, have delineated Well Head Protection Areas. Such protection involves protecting ground water supplies by eliminating and controlling pollution sources that may affect surface and sub-surface areas surrounding water wells or well fields. South Dakota has divided levels of protection into three different zones. Zone A is the area most immediate to wells and requires the highest degree of protection from potential contaminants. Zone B is an intermediate zone and requires less protection than Zone A; this generally includes shallow aquifer boundaries. Zone C includes the outermost portion of a wellhead protection area. Shallow aquifer boundaries, and thus Zone B areas, exist throughout the proposed Project area, generally underlying surface waters where groundwater recharge occurs. There are Zone A Well Head Protection Areas in and around the town of Astoria in Deuel County in the north-central part of the proposed Project area (DCPC 2004b).

3.3.4 Wetlands

Wetlands are scattered throughout much of eastern South Dakota. The types of wetlands found in this area range from large lakes to small temporary wetlands, such as prairie potholes. Wetlands are characterized by hydrological indicators, hydric soils, and hydrophytic vegetation. Examples of hydrophytic vegetation commonly found in eastern South Dakota include reed canarygrass (*Phalaris arundinacea*), prairie cordgrass (*Spartina pectinata*), cattails (*Typha* spp.), numerous sedge species, coyote willow (*Salix exigua*), peach-leaved willow (*Salix amygdaloides*), and plains cottonwood (*Populus deltoides*) (EDAW 2009a). Wetlands provide wildlife habitat, nutrient storage, water quality protection, flood control, and groundwater recharge. Wetlands in the proposed Project area of both alternative sites and associated facilities are indicated in appendix B.

The proposed Project area for both alternative sites and associated facilities contains a high density of small wetlands (Tiner 1999; SDDENR 2008b). These “prairie potholes” are an essential habitat for many migrating birds. Because the Upper Midwest region has a wide range of rainfall patterns, the boundaries of prairie potholes are difficult to identify during dry years because the drier portions of these wetlands are often cultivated and tilled (Tiner 1999).

The USFWS created Waterfowl Production Areas (WPAs) to protect and preserve wetland resources in South Dakota. An estimated 700 WPAs covering approximately 183,000 acres of wetlands and uplands were purchased by 1994. In addition, the FWS obtained easements on an estimated 613,000 wetland acres in South Dakota through 1994 (SDDENR 2008b). In the area of the proposed Project, WPAs are located to the east and west of the White Site 1 Natural Gas Pipeline route along the Deuel-Brookings county line. These WPAs are administered by the Madison Wetland Management District. In adjacent areas of Minnesota, WPAs in Lincoln County are administered by the Big Stone Wetland Management District.

The NRCS oversees the Wetlands Reserve Program (WRP), which is a voluntary program that provides financial incentives to landowners to protect, restore, and enhance wetlands on their property. Landowners either sell a conservation easement or enter into a cost-share restoration agreement with the USDA to protect and restore wetlands (USDA NRCS 2007).

As part of the look at the wetlands existing in the area, National Wetland Inventory (NWI) maps were reviewed in relation to the proposed Project facilities associated with the two alternative sites. This data allowed a comparison of the existing conditions for both proposed sites without conducting a detailed wetland delineation. This process was used as a screening tool to provide information about wetlands present for both sites and associated facilities. The more detailed wetland delineation used as part of the analysis to determine impacts to wetlands for the Applicant's preferred site is presented in section 4.4.2.

3.3.4.1 Facility Sites

White Site 1

NWI wetlands of 1.60 acres are indicated on maps for White Site 1. Wetlands at White Site 1 are associated with an intermittent drainage probably inundated during the wettest periods of the growing season. These are palustrine emergent (PEM) wetlands. Deer Creek is a tributary to the Big Sioux River, which is classified by the USACE as a traditional navigable water. Because the PEM wetlands are associated with an unnamed drainage which empties downstream into Deer Creek, these wetlands are likely jurisdictional waters. The jurisdictional status of the waters will be confirmed during section 404 permitting.

White Site 2

Based on available NWI maps and observations from public access roads, many of the small, isolated prairie pothole wetlands have been converted from hydrophytic vegetation to agricultural crops. However, some of the pothole wetlands are still intact. Many of the potholes have wetland hydrology and likely have hydric soils. NWI wetlands on White Site 2 total 1.69 acres. There are an additional 0.05 acres of NWI wetlands on the rural water pipeline extension.

3.3.4.2 Water Well Supply Site B and Water Pipeline

Water Well Supply Site B contains 5.18 acres of NWI wetlands. Most are associated with Deer Creek and adjacent topographic depressions on the southern half of the site. Deer Creek flows from east to west through the center of Site B. Hydrophytic vegetation associated with these wetlands includes reed canarygrass, barnyardgrass (*Echinochloa* spp.), bog yellow cress (*Rorippa palustris*), and creeping foxtail (*Alopecurus arundinaceus*). There are no NWI wetlands associated with the water pipeline to the facility site.

3.3.4.3 Natural Gas Pipeline Corridors

White Site 1 Natural Gas Pipeline Route

Approximately 1.75 acres of wetlands are indicated on NWI maps. Wetland features are associated with swales, topographic depressions, and perennial and intermittent drainages. The northern portion of the proposed corridor has several uncultivated prairie potholes and depressional wetlands. Most surface waters within the corridor contain wetland vegetation. The proposed corridor crosses nine drainages, including four tributaries to Deer Creek near the central and southern portions of the corridor and three tributaries to Oak Lake. Wetlands associated with the Deer Creek tributaries are likely classified as jurisdictional. The wetlands associated with isolated topographic depressions are likely non-jurisdictional, but are protected under EO 11990, Protection of Wetlands.

White Site 2 Natural Gas Pipeline Route

Upon the review of existing NWI maps and observations from public access roads, PEM, PSS, PFO wetlands totaling 0.61 acres are located within the White Site 2 Natural Gas Pipeline corridor. Wetland features are associated with swales, topographic depressions, and intermittent and perennial drainages. The northern portion of the alternative corridor contains numerous uncultivated prairie potholes and depressional wetlands that contain hydrophytic vegetation. This corridor crosses an estimated 17 drainages, including one tributary to Oak Lake, five tributaries to Deer Creek, and three intermittent tributaries to Six Mile Creek. Given the extensive involvement with streams, the alternative pipeline corridor would contain more area of wetlands than the preferred corridor.

3.3.4.4 Transmission Corridors

White Site 1 Transmission Line

No NWI wetlands are indicated in the White Site 1 Transmission Line corridor.

White Site 2 Transmission Line

Based upon observations from public access roads and the review of NWI wetland data, wetlands within the White Site 2 Transmission Line corridor include PEM, PSS, and PFO wetlands. Based on NWI maps, there are 1.7 acres of wetlands within the White Site 2 Transmission Line corridor. Wetland features are associated with swales, intermittent and perennial drainages, and topographic depressions. All perennial drainages appear to be south-flowing tributaries to Deer Creek. Wetland vegetation is similar to that found in the White Site 1 Transmission Line corridor.

3.4 BIOLOGICAL RESOURCES

3.4.1 Vegetation

The majority of the proposed Project area assessed for both sites and associated facilities is within the Big Sioux Basin, which has a well-developed drainage network. The ecoregion is in South Dakota and extends into southwestern Minnesota. The gentle topography and small number of wetlands in this ecoregion allow for more tilled land than adjacent ecoregions. Natural vegetation in the Big Sioux Basin ecoregion is primarily tall grass prairie plants, which includes big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), Indiangrass (*Sorghastrum nutans*), sideoats grama (*Bouteloua curtipendula*), and lead plant (*Amorpha canescens*). Other natural vegetation in this ecosystem includes hardwood trees, such as ash species (*Fraxinus* spp.), bur oak (*Quercus macrocarpa*), Osage orange (*Maclura pomifera*), as well as riparian plants, including willows (*Salix* spp.) and cord grasses (*Spartina* spp.). Cultivated crops include small grains, corn, sunflowers, and soybeans (Bryce et al. 1998).

A portion of the northeastern corner of the proposed Project area assessed for both sites is located in the Prairie Coteau ecoregion. The eastern arm of this ecoregion extends through parts of Minnesota and South Dakota. There is a poorly developed drainage pattern, as the landscape formed from glacial ice melting under a layer of sediment. The Prairie Coteau contains numerous wetlands and natural lakes. Natural vegetation in the Prairie Coteau ecoregion is also primarily tall grass prairie plants, including big and little bluestem, switchgrass, Indiangrass, and blue grama (*Bouteloua gracilis*). Land use includes pastureland in rolling areas and cultivated crops of small grains, corn, and soybeans in flat areas (Bryce et al. 1998).

Prior to field visits, aerial photography and National Land Cover Data (NLCD) were used in order to identify vegetation communities within the proposed Project area. During the field visits, Global Positioning System (GPS) units were used to record the density of noxious weeds and vegetation communities in the pipeline corridors. Although a complete inventory was not conducted during these field visits, a list of all observed vegetation species was created (EDAW 2009a). The vegetative composition of the proposed Project area is primarily cultivated crops and grassland (table 3-1).

Table 3-1: Vegetative Composition of the Proposed Project Area

Vegetation Type	Acres	Percent of Project Area
Open Water	2,119.20	2.71%
Developed, Open Space	2,628.00	3.36%
Barren Land (Rock/Sand/Clay)	12.01	0.02%
Deciduous Forest	463.69	0.59%
Grassland/Herbaceous	29,263.38	37.42%
Planted Pasture/Hay	6,632.93	8.48%
Cultivated Crops	34,366.45	43.95%
Woody Wetlands	23.57	0.03%
Emergent Herbaceous Wetlands	2,601.57	3.33%

The largest vegetation category, comprising about 44 percent of the proposed Project area, is cultivated annual crops. The areas under this classification also include lands being actively tilled. Agricultural crops in the proposed Project area include, in order of dominance, corn, hay, soybeans, and winter wheat (EDAW 2009a). The second largest vegetation type is grasslands, which account for more than 37 percent of the proposed Project area. These areas may be used for livestock grazing. The most common plants found in upland pasture areas are creeping bentgrass (*Agrostis stolonifera*), smooth brome (*Bromus inermis*), western wheatgrass (*Pascopyrum smithii*), Kentucky bluegrass (*Poa pratensis*), and tall dropseed (*Sporobolus asper*); bentgrass and brome are introduced species (EDAW 2009a). Smaller percentages of the area are in planted pasture and hay, developed lands, and wetlands.

3.4.2 Noxious Weeds

According to South Dakota statute FS 525, "Noxious Weed Control", landowners are required to control noxious weeds on their land. This is enforced by the South Dakota Department of Agriculture (SDDA). Federal agencies are also directed to prevent the introduction of invasive species and ensure that its actions are not likely to cause or promote the introduction or spread of invasive species (EO 13112). Noxious weeds are a problem for a number of reasons. They threaten wildlife by replacing natural vegetation and nesting habitat, threaten native plant species, and reduce crop productivity and increase soil erosion, contributing to sedimentation in water bodies, which in turn affects fish habitat (SDDOA DAS 2009).

South Dakota has two designations of noxious weeds, State and local. Table 3-2 and table 3-3 provide the State and locally listed noxious weeds and the acreage that each species affects in Brookings and Deuel Counties, as reported by the SDDA (2007). Noxious weeds identified during field surveys include Canada thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*), and absinth wormwood (*Artemisia absinthium*).

Table 3-2: South Dakota State-Listed Noxious Weeds in Brookings and Deuel Counties

Scientific Name	Common Name	Infested Acres in Brookings County	Infested Acres in Deuel County
Cirsium arvense	Canada Thistle	>50,001	>50,001
Euphorbia esula	Leafy Spurge	1,001 - 5,000	>10,001
Lythrum salicaria	Purple Loosestrife	None Reported	<100
Sonchus arvensis	Perennial Sow Thistle	1,001 - 5,000	1,001 - 5,000

Source: South Dakota Department of Agriculture (2007), Retrieved February 4, 2009
http://www.state.sd.us/doa/das/noxious.htm

Table 3-3: South Dakota Locally Listed Noxious Weeds in Brookings and Deuel Counties

Scientific Name	Common Name	Infested Acres in Brookings County	Infested Acres in Deuel County
Artemisia absinthium	Absinth Wormwood	201 - 1,000	5,001 - 10,000
Carduus acanthoides	Plumeless Thistle	501 - 1,000	>10,000
Carduus nutans	Musk Thistle	501 - 1,000	>10,000

Source: South Dakota Department of Agriculture (2007), Retrieved February 4, 2009
http://www.state.sd.us/doa/das/noxious.htm

3.4.3 Wildlife

The Prairie Pothole Region, of which the Big Sioux and Prairie Coteau ecoregions are a small portion, is the most important waterfowl-producing region on the North American continent. Thousands of wildlife species likely occur within the State of South Dakota. There are more than 414 species of birds that occur within the State, including both resident and migratory species (Baker 2005). Appendix C lists some of the birds, mammals, reptiles, and amphibians that may occur near or within the proposed Project area. Appendix D lists fish species that may occur near or within the proposed Project area. The primary habitat types that occur within the proposed Project area are agricultural lands (pastureland and cropland), tall and mixed-grass prairie, woodlands (shelterbelts), wetlands, and riparian communities. The majority of the land within the proposed Project area is used for agricultural purposes. This section discusses common wildlife and habitats that may occur in the proposed Project area (EDAW 2009a).

The two species of big game that may occur within the proposed Project area are mule deer (*Odocoileus hemionus*) and white-tailed deer (*Odocoileus virginianus*). White-tailed deer are found throughout South Dakota and prefer wooded vegetation and river drainages on the prairie (Rice 1994). SDGFP harvest numbers indicate white-tailed deer are adapting and moving into agricultural landscapes and foraging in croplands. Wetlands, riparian areas, and shelterbelts are crucial for white-tailed deer cover during winter months and throughout the year. Mule deer are uncommon in the area, although their range within South Dakota does include the proposed Project area.

Coyote (*Canis latrans*), red fox (*Vulpes vulpes*), American badger (*Taxidea taxus*), raccoon (*Procyon lotor*), porcupine (*Erethizon dorsatum*), and striped skunk (*Mephitis mephitis*) are some of the larger mammals found within the proposed Project area, and these mammals use a variety of habitats including mixed-grass prairie, pastureland, forested areas, and drainages. Six species of bats are known to occur or have suitable habitat occurring within the proposed Project area (appendix C). Bats utilize tree cavities, crevices, caves, and overhangs as roosting sites, and are often found in proximity to surface water. The majority of other small mammals in eastern South Dakota are adapted to prairie and woodland habitats and associated drainages. These species include, but are not limited to, the least weasel (*Mustela nivalis*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), northern grasshopper mouse (*Onychomys leucogaster*), and prairie vole (*Microtus ochrogaster*).

Migrant and resident bird species in prairie habitat that may occur near the proposed Project include the brown-headed cowbird (*Molothrus ater*), eastern meadowlark (*Sturnella magna*), western meadowlark (*Sturnella neglecta*), red-winged blackbird (*Agelaius phoeniceus*), eastern bluebird (*Sialia sialis*), eastern kingbird (*Tyrannus tyrannus*), great blue heron (*Ardea herodias*), northern harrier (*Circus cyaneus*), killdeer (*Charadrius vociferus*), field sparrow (*Spizella pusilla*), northern flicker (*Colaptes auratus*), belted kingfisher (*Ceryle alcyon*), common nighthawk (*Chordeiles minor*), tree swallow (*Tachycineta bicolor*), turkey vulture (*Cathartes aura*), as well as numerous species of migrant shorebirds. Wild turkey (*Meleagris gallopavo*), mourning dove (*Zenaida macroura*), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), as well as numerous other waterfowl species, are game bird species that may be found surrounding the proposed Project

Some common reptile and amphibian species that may occur near or within the proposed Project area include American toad (*Anaxyrus americanus*), bullfrog (*Lithobates catesbeiana*), tiger salamander (*Ambystoma tigrinum*), snapping turtle (*Chelydra serpentine*), ring-necked snake (*Diadophis punctatus*), and common garter snake (*Thamnophis sirtalis*). Amphibian species are most likely to be encountered around semi-permanent or permanent wetland areas, but are also found around man-made wetlands and riverine wetland areas (Fischer et al. 1999).

There are approximately 52 fish species that may occur near or within the proposed Project area. Water bodies located in and around the proposed Project range from small, unnamed tributaries to larger rivers and streams such as Deer Creek, as well as farm ponds and medium-sized lakes such as Lake Hendricks and Oak Lake. Common game fish species that may occur within the proposed Project area include channel catfish (*Ictalarus punctatus*), white crappie (*Pomoxis annularis*), smallmouth bass (*Micropterus dolomieu*), walleye (*Stizostedion vitreum*), and bluegill (*Lepomis macrochirus*). Nongame fish species such as creek chub (*Semotilus atromaculatus*), fathead minnow (*Pimephales promelas*), and banded killifish (*Fundulas diaphanous*) are likely to be found within the proposed Project area as well.

3.4.4 Special Status Species

County lists from the USFWS were used in determining which endangered species have the potential to occur in the proposed Project area. A recent EIS prepared for the White Wind Farm located adjacent to the proposed Project was also used to assist in the evaluation of impacts to endangered, threatened, proposed, and candidate species. In addition, an April 7, 2009, letter received from the USFWS contained lists of species and discussed other wildlife issues. The area of the proposed Project potentially contains habitat for two federally-listed endangered species, the Topeka shiner (*Notropis topeka*) and the American burying beetle (*Nicrophorus americanus*); one federally-listed threatened species, the western prairie fringed orchid (*Platanthera praeclara*); and one candidate species, the Dakota skipper (*Hesperia dacotae*). The list of plant and animal species considered threatened or endangered by the State of South Dakota was also reviewed (SDNHP 2008). Protected species with the potential to occur in the area of the proposed Project are listed in table 3-4.

Table 3-4: Threatened, Endangered, and Candidate Species

Name	Scientific Name	Federal Status	State Status
Invertebrates			
American burying beetle	*Nicrophorus americanus*	Endangered	
Dakota skipper	*Hesperia dacotae*	Candidate	Threatened
Fish			
Northern redbelly dace	*Phoxinus eos*		Threatened
Topeka shiner	*Notropis topeka*	Endangered	
Banded killifish	*Fundulus diaphanus*		Endangered
Blacknose shiner	*Notropis herolepis*		Endangered
Sturgeon chub	*Macrhybopsis gelida*		Threatened
Birds			
Bald eagle	*Haliaeetus leucocephalus*	*	Threatened
Osprey	*Pandion haliaetus*		Threatened
Whooping crane	*Grus americana*	Endangered	Endangered
Amphibians and Reptiles			
Eastern hognose snake	*Heterodon platirhinos*		Threatened
Lined snake	*Tropidoclonion lineatum*		Endangered
Northern red-bellied snake	*Storeria occipitomaculata*		Special Concern
Plants			
Western prairie fringed orchid	*Platanthera praeclara*	Threatened	

*Federally protected by the Bald and Golden Eagle Protection Act

Based on review of habitat information, state-listed species with the potential to occur in the proposed Project area are Dakota skipper, northern redbelly dace, banded killifish, blacknose shiner, and northern redbellied snake. Habitat descriptions for these protected species are found in Appendix E.

3.5 SOCIOECONOMIC RESOURCES

Various socioeconomic issues have been taken into consideration in analyzing the impacts of the proposed Project. Socioeconomic characteristics within the proposed Project area are discussed below and include population growth, racial and ethnic characteristics, housing trends, economic indicators, and employment.

3.5.1 Population Growth

Astoria, with a population of 150 persons in 2000, is one mile west of the proposed White Site 1 Natural Gas Pipeline Route and two miles east of the White Site 2 Natural Gas Pipeline Route (figure 2-1). White is six miles northwest of White Site 1 and four miles southwest of White Site 2, and has a 2000 population of 530. Astoria and White have remained relatively stable in population in recent years. The City of Brookings is located about 14 miles to the southwest of White Site 1 and 16 miles to the southwest of White Site 2. The population of Brookings grew from 16,270 in 1990 to 18,504 in 2000, a growth rate of 13.7 percent (U.S. Census Bureau 1990 and 2000). Brookings County grew by 12 percent from 1990 to 2000, while Deuel County lost 0.5 percent of its population (table 3-5). Adjacent Lincoln County, Minnesota also lost population.

Table 3-5: Population Change

	Population		% Change
	1990	2000	1990 to 2000
Counties			
Brookings County	25,207	28,220	12.0%
Deuel County	4,522	4,498	-0.5%
City/Town			
Astoria	155	150	-3.2%
Brandt	123	113	-8.1%
Brookings	16,270	18,504	13.7%
Bushnell	81	75	-7.4%
Toronto	201	202	0.5%
White	536	530	-1.1%

Source: US Census Bureau, 1990 and 2000 Census

The Brookings County comprehensive plan estimates that by 2015, the county will have a population of 28,228 persons, and the Deuel County comprehensive plan estimates that the county will experience a decrease in population by 2020 with 3,915 persons. The Lincoln County, Minnesota comprehensive plan estimates that by 2030 the population of the county will be between 4,500 and 6,500 persons.

3.5.2 Racial and Ethnic Characteristics

In order to characterize the racial and ethnic characteristics of the population in the area of the proposed Project, census data is analyzed at the county, city, and census block group levels.

The majority of the population of Brookings and Duel counties is white (table 3-6). The racial composition of the Block Groups covering the proposed Project area is similar to that of Brookings and Deuel counties. There are three census block groups that extend through the proposed Project area. The racial composition of the population in these census block groups is displayed with the county and city data in table 3-6, Population by Race. As compared to the population of Brookings County and the proposed Project area as a whole, the percent of the population that is American Indian/Alaskan and Hispanic is higher in Block Group 2 of Census Tract 9586. In this Block Group, 2.1 percent of the population is American Indian/Alaskan and 2.3 percent of the population is Hispanic. This Block Group also has the lowest percentage of white residents, with 95.6 percent. Overall, there is very little variation in the racial and ethic breakdown between the Block Groups, or between the Block Groups and the counties.

Table 3-6: Population by Race

	Total Pop.	White	Black or African American	American Indian/ Alaskan	Asian	Hawaiian/ Pacific Islander	Some other race	Two or more races	Hispanic*
Counties									
Brookings County	28,220	96.36%	0.31%	0.90%	1.34%	0.04%	0.30%	0.75%	0.88%
Deuel County	4,498	98.51%	0.09%	0.29%	0.18%	0.02%	0.24%	0.67%	0.76%
Lincoln County	6,429	98.82%	0.05%	0.28%	0.20%	0.00%	0.42%	0.23%	0.86%
Block Groups									
CT 9536, BG 3 (Deuel County)*	827	98.43%	0.24%	0.12%	0.24%	0.00%	0.36%	0.60%	0.48%
CT 9586, BG 1 (Brookings County)	1,306	98.62%	0.08%	0.54%	0.00%	0.00%	0.00%	0.77%	1.15%
CT 9586, BG 2 (Brookings County)	614	95.60%	0.00%	2.12%	0.81%	0.00%	0.81%	0.65%	2.28%

Source: US Census Bureau, 2000 Census

*CT (Census Tract), BG (Census Block Group)

3.5.3 Housing Trends

Single-family housing accounts for 58.4 percent of the housing in Brookings County, 84.3 percent of the housing in Deuel County, and 88.3 percent in Lincoln County (LCESO 2009). By comparison, all three census block groups within the proposed Project area have a higher percentage of single-family housing units as compared to both counties, with Block Group 1 of Census Tract 9586 having the highest at 87.9 percent. Block Group 3 of Census Tract 9536 has the lowest percentage with 86 percent (table 3-7).

In Brookings County, multi-family housing varies in the number of units per structure including structures with 50 or more units. Deuel and Lincoln counties have less variety in housing types than Brookings County, with no residential structures containing more than 10 to 19 units. Mobile homes comprise 11.8 percent of total housing in Brookings County, 6.8 percent of total housing in Deuel County, and 3.2 percent in Lincoln County. The block groups in the proposed Project area vary little in the percentage of mobile homes with 5.2 to 7.4 percent.

Table 3-7: Comparison of Housing Units by Type

	Housing Units	Single Family	Multi-Family (Number of Units in Structure)						Mobile Home
			2	3 or 4	5 to 9	10 to 19	20 to 49	50+	
Counties									
Brookings County	11,576	58.38%	2.51%	3.32%	6.82%	7.50%	8.42%	1.21%	11.80%
Deuel County	2,172	84.25%	0.97%	2.99%	2.99%	1.89%	0.00%	0.00%	6.81%
City/Town									
Astoria	77	76.62%	0.00%	10.39%	6.49%	0.00%	0.00%	0.00%	6.49%
Brandt	57	91.23%	0.00%	7.02%	0.00%	0.00%	0.00%	0.00%	1.75%
Brookings	7,371	47.23%	3.38%	4.40%	9.29%	11.19%	13.08%	1.90%	9.54%
Bushnell	28	75.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%
Toronto	109	79.82%	1.83%	13.76%	0.00%	0.00%	0.00%	0.00%	4.59%
White	220	80.45%	0.00%	0.00%	10.45%	0.91%	0.00%	0.00%	8.18%
Block Groups									
CT 9536, BG 3 (Deuel County)*	406	85.96%	0.49%	6.65%	1.72%	0.00%	0.00%	0.00%	5.17%
CT 9586, BG 1 (Brookings County)	555	87.93%	0.00%	0.00%	4.32%	0.36%	0.00%	0.00%	7.39%
CT 9586, BG 2 (Brookings County)	246	86.59%	2.85%	1.22%	2.44%	0.00%	0.00%	0.00%	6.91%

Source: US Census Bureau, 2000 Census
*CT (Census Tract), BG (Census Block Group)

Based on 2000 Census data, there is a 58.2 percent homeownership rate in Brookings County, a 80 percent homeownership rate in Deuel County, and an 80.3 percent homeownership rate in Lincoln County. Of the census block groups in the proposed Project area, homeownership rates vary only slightly. The vacancy rate for Brookings County is 7.9 percent, and the vacancy rate for Deuel County is 15.1 percent.

The median year built for residential structures is 1972 in Brookings County and 1952 in Deuel County. By comparison, all of the block groups have an older housing stock when compared to the county they are in. In 2000, the median home value was $88,500 in Brookings County, $44,400 in Deuel County, and $43,700 in Lincoln County. In 2000, the median rent for renter-occupied housing was $396 in Brookings County, $303 in Deuel County, and $326 in Lincoln County. Rents in the census block groups varied; the lowest was Block Group 3 of Census Tract 9536 with $296 and the highest, with $355, was Block Group 1 of Census Tract 9586 (table 3-8).

Table 3-8: Housing Characteristics

	Total Occupied Housing Units	Home-ownership Rate	Vacancy Rate	Median Year Structure Built	Median Value Owner-Occupied**	Median Rent Renter-Occupied**
Counties						
Brookings County	10,665	58.2%	7.9%	1972	$88,500	$396
Deuel County	1,843	80.0%	15.1%	1952	$44,400	$303
City/Town						
Astoria	73	79.5%	5.2%	1944	$17,800	$221
Brandt	43	88.4%	24.6%	1939	$10,000	$392
Brookings	6,963	46.2%	5.5%	1974	$93,900	$393
Bushnell	27	66.7%	3.6%	1956	$60,000	$575
Toronto	93	79.6%	14.7%	1939	$34,100	$338
White	205	76.6%	6.8%	1939	$53,000	$338
Block Groups						
CT 9536, BG 3 (Deuel County)**	348	84.8%	14.3%	1939	$26,000	$296
CT 9586, BG 1 (Brookings County)	479	83.3%	13.7%	1941	$60,000	$355
CT 9586, BG 2 (Brookings County)	231	78.4%	6.1%	1968	$60,600	$363

Source: US Census Bureau, 2000 Census
*CT (Census Tract), BG (Census Block Group)
**In 2000

3.5.4 Economic Indicators

In 2000, 4.9 percent of the 17,207 Brookings County residents in the civilian labor force were unemployed, and 1.3 percent of the 2,253 Deuel County residents in civilian labor force were unemployed (table 3-9). Lincoln County, Minnesota was similar, with a 2.2 percent unemployment rate.

Table 3-9: Economic Indicators

	Total Population	Civilian Labor Force	Unemployment Rate	Median Household Income, 1999	% Population Below Poverty in 1999
Counties					
Brookings County	28,220	17,207	4.9%	$35,438	12.6%
Deuel County	4,498	2,253	1.3%	$31,788	10.3%
City/Town					
Astoria	150	85	0.0%	$24,375	20.7%
Brandt	113	39	15.4%	$30,417	15.9%
Brookings	18,504	11,628	6.3%	$31,266	15.8%
Bushnell	75	43	7.0%	$45,625	8.0%
Toronto	202	86	1.2%	$23,750	8.9%
White	530	257	1.2%	$31,528	6.2%
Block Groups					
CT 9536, BG 3 (Deuel County)**	827	398	2.3%	$28,889	12.9%
CT 9586, BG 1 (Brookings County)	1,306	662	1.2%	$36,445	8.1%
CT 9586, BG 2 (Brookings County)	614	377	2.4%	$43,594	8.5%

Source: US Census Bureau, 2000 Census
*CT (Census Tract), BG (Census Block Group)

The median household income in 1999 was $35,438 in Brookings County, $31,788 in Deuel County, and $31,607 in Lincoln County. Median household incomes in the proposed Project area census block groups ranged from a low of $28,889 in Block Group 3 of Census Tract 9536 to a high of $43,594 in Block Group 2 of Census Tract 9586. The 1999 poverty rate for Brookings County was 12.6 percent, the rate for Deuel County was 10.3 percent, and the rate for Lincoln County was 9.7 percent. The proposed Project area census block group with the lowest poverty rate was Block Group 1 of Census Tract 9586, with an 8.1 percent rate. Block Group 3 of Census Tract 9536 had the highest poverty rate, or 12.9 percent.

3.5.5 Employment

In Brookings County, the industries with the highest percentage of employment included educational, health and social services (27.1 percent), followed by manufacturing (20.8 percent), and then retail trade (10 percent). The top three industries for Deuel County were educational, health and social services (21.1 percent), manufacturing (19.7 percent), and agriculture, natural resources, and mining (17.1 percent). The top three industries for Lincoln County were education, health and social services (25.6 percent), agriculture, natural resources and mining (16.7 percent), and manufacturing (12.5 percent).

In all of the census block groups in the proposed Project area, educational, health and social services had the highest percentage of employment. The percent employed in educational, health and social services for these block groups ranged from 20.6 percent in Block Group 3 of Census Tract 9536 to 25.8 percent in Block Group 2 of Census Tract 9586. Manufacturing was in the top three in all census block groups, ranging from 18.5 percent in Block Group 3 of Census Tract 9536 to 21.5 percent in Block Group 2 of Census Tract 9586. Agriculture, natural resources, and mining were also in the top three in all of the census block groups. The percent employed in this sector ranged from 13.9 percent in Block Group 1 of Census Tract 9586 to 18 percent in Block Group 3 of Census Tract 9536 (table 3-10).

3.6 ENVIRONMENTAL JUSTICE

Environmental justice concerns may arise from human health or environmental effects of a project on either minority or low-income populations. The need to identify environmental justice issues is stated in EO 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations." The EO states "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." A Presidential Memorandum accompanying the EO directed agencies to incorporate environmental justice concerns in their NEPA processes and practices.

Table 3-10: Employment by Industry

Employment by Industry	Counties		City / Town						Block Groups		
	Brookings County	Deuel County	Astoria	Brandt	Brookings	Bushnell	Toronto	White	CT 9536, BG 3 (Deuel County)**	CT 9586, BG 1 (Brookings County)	CT 9586, BG 2 (Brookings County)
Total Employed Civilian Labor Force	**16,369**	**2223**	**85**	**33**	**10900**	**40**	**85**	**254**	**389**	**654**	**368**
Agriculture, nat. resource, mining	5.9%	17.14%	5.88%	0.00%	3.85%	0.00%	8.24%	3.94%	18.0%	13.91%	17.7%
Construction	4.0%	6.03%	14.12%	12.12%	3.20%	5.00%	3.53%	6.30%	8.2%	6.27%	6.5%
Manufacturing	20.8%	19.66%	14.12%	24.24%	19.72%	45.00%	34.12%	24.41%	18.5%	21.10%	21.5%
Wholesale trade	1.6%	2.02%	3.53%	3.03%	1.24%	0.00%	0.00%	3.54%	2.8%	2.14%	0.8%
Retail trade	10.0%	8.01%	4.71%	6.06%	11.02%	12.50%	15.29%	10.63%	7.2%	9.63%	4.3%
Transportation and utilities	3.3%	6.21%	9.41%	6.06%	2.46%	7.50%	9.41%	5.91%	5.7%	5.81%	4.1%
Information	2.0%	2.11%	0.00%	0.00%	2.00%	0.00%	2.35%	2.76%	0.8%	1.07%	0.5%
Financial	4.2%	4.00%	10.59%	0.00%	4.09%	0.00%	0.00%	3.15%	6.9%	2.45%	4.1%
Professional and business	4.7%	2.11%	0.00%	6.06%	5.42%	15.00%	0.00%	3.54%	1.0%	4.74%	4.9%
Educ., health and social services	27.1%	21.14%	21.18%	21.21%	28.94%	5.00%	20.00%	27.56%	20.6%	25.08%	25.8%
Leisure, hospitality, food	9.9%	3.42%	3.53%	6.06%	12.12%	5.00%	0.00%	5.12%	1.5%	3.67%	2.2%
Other services	3.5%	4.95%	12.94%	15.15%	2.97%	0.00%	3.53%	1.57%	6.7%	2.75%	3.8%
Public administration	3.0%	3.19%	0.00%	0.00%	2.96%	5.00%	3.53%	1.57%	2.1%	1.38%	3.8%

Source: US Census Bureau, 2000 Census
*CT (Census Tract), BG (Census Block Group)

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Environmental justice issues are identified by determining whether minority or low-income populations in the proposed Project area are meaningfully greater than for Brookings and Deuel counties as a whole. If so, disproportionate effects on these populations will be considered. For the purposes of analyzing the proposed Project, minority populations are identified by comparing the percent minority residents for those census blocks within the vicinity to the percent for Brookings and Deuel counties as a whole. CEQ guidance (CEQ 1997) states that minority populations should be identified when the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population. Census blocks with minority populations that exceed the city level by more than ten percent are considered to be “meaningfully greater” for the purposes of this analysis.

Of the 149 census blocks in the proposed Project area, four census blocks have a minority population that is ten percent or more greater than the county as a whole. These four blocks are in Census Tract 9586 in Brookings County. Twenty-five percent of Census Block 1081 and 20 percent of Census Block 1149 identified themselves as American Indian or Alaskan in 2000. Eleven percent of Census Block 2002 and 21.4 percent of Census Block 1075 indentified themselves as Hispanic or Latino. Low-income populations are identified by comparing the percent of the population with incomes below established poverty levels for those census block groups within the proposed Project area to the percent below poverty for Brookings and Deuel counties as a whole. Census block groups with low-income populations that exceed the county level by more than ten percent are considered to be areas of environmental justice concern. None of the block groups in the proposed Project area exceed the county levels by 10 percent or more.

3.7 LAND USE

3.7.1 Comprehensive Plans

The Comprehensive Land Use Plan for Brookings County, adopted July 25, 2000, serves as a general policy guide for directing future land use within the unincorporated portions of the county (BCPC 2000). The plan includes general land development goals as well as a future land use map. The portion of the proposed Project area within Brookings County is classified as an Area of Development Stability on the future land use map. The goal for this land use category is the preservation of agricultural land by preventing the encroachment of urban land uses. The focus of these areas is agricultural, although there may be occasional residences or commercial/industrial (CI) developments.

The Comprehensive Land Use Plan for Deuel County, adopted May 5, 2004, guides the future land development of the unincorporated portions of the county (DCPC 2004a). The plan includes general land development goals and a future land use map. The portion of the proposed Project within Deuel County is primarily classified as an Area of Development Stability on the future land use map. The focus of this land use category is agriculture. The town of Astoria, which lies within the proposed Project area, is classified as an Area of Development Advantage on the future land use map. The goal for this land use category is to encourage growth within or immediately adjacent to municipalities in order to discourage the premature development of agricultural lands.

3.7.2 Zoning

Land use and development in unincorporated Brookings County is regulated by the Brookings County Zoning Regulation (BCPC 2007). The regulations establish four zoning districts, which include Agricultural (A), CI, Lake Park (LP), and Natural Resources (NR). The portion of the proposed Project area that is in Brookings County is primarily zoned Agricultural. The purpose of the district is "to maintain and promote farming and related activities within an environment which is generally free of other land use activities. Residential development will be discouraged to minimize conflicts with farming activities and reduce the demand for expanded public services and facilities" (p. 11.00-1). Within the proposed Project area, there are a few LP and NR zoned districts; they are primarily adjacent to Oak Lake, Lake Hendricks, and Black Slough. The LP district is established to regulate residential development along the lakeshores. The NR district provides protection for sensitive natural environments to preserve natural vegetation and protect wildlife habitat. The zoning regulations also establish two overlay districts, which include the Flood Plain Overlay District and the Aquifer Protection Overlay District. Floodplain and aquifer protection are discussed further in section 3.3.

The Deuel County Zoning Ordinance regulates land use and development in the unincorporated portions of the county (DCPC 2004b). The ordinance establishes five zoning districts and one overlay district, which include A, CI, LP, NR, Town (TD), and Aquifer Protection Overlay (AP). The portion of the proposed Project area that is in Deuel County is primarily zoned Agricultural. Permitted land uses in the A zone generally include agricultural related uses. There is a small area in the northern portion of the proposed Project area zoned CI. The CI District is "intended for commercial and industrial uses which due to their size and nature require highway access." There is also an area zoned NR near the town of Astoria. The NR District provides protection for sensitive natural resources and wildlife habitat and includes areas such as floodplains, abandoned quarries, wetlands, natural prairies, and historical sites.

3.7.3 Existing Land Use

The majority of land in Brookings County is unincorporated agricultural land. There are nine incorporated municipalities in the county, the largest of which is the City of Brookings with a population of 18,504 (U.S. Census Bureau 2000). The other municipalities (Arlington, Aurora, Bruce, Bushnell, Elkton, Sinai, Volga, and White) are small towns with populations of less than 1,500 (U.S. Census Bureau 2000). Within the unincorporated portions of Brookings County, there is very little development, consisting primarily of scattered farm and non-farm residences and occasional commercial or industrial establishments (BCPC 2000). A number of unoccupied, abandoned home sites also exist in the proposed Project area.

Deuel County also contains primarily unincorporated agricultural land. There are seven incorporated municipalities in the county (Altamont, Astoria, Brandt, Clear Lake, Gary, Goodwin and Toronto), one unincorporated community (Bemis), and one lakefront development (Lake Cochrane). Of the incorporated communities, Clear Lake is the largest, with a population of 1,335 (U.S. Census Bureau, 2000). The other municipalities have populations of less than 250 (U.S. Census Bureau 2000). The unincorporated portions of Deuel County are primarily agricultural land, with scattered farm and non-farm residences and occasional commercial and industrial establishments (DCPC 2004a). There are also approximately 71 construction aggregate mining sites in the county, which include both active and State permitted, non-active sites.

The proposed Project area extends through the townships of Lake Hendricks, Oaklake, Richland and Sherman in Brookings County and Scandinavia Township in Deuel County. Almost all of the proposed Project area is unincorporated agricultural land, except for the town of Astoria, which is located in the northern portion of the proposed Project area. Other land uses within the proposed Project area include scattered rural residences, livestock operations, the White substation, and transmission lines. A portion of Lake Hendricks lies within the proposed Project area, and there is a concentration of residential development along the lakeshore.

Based on NLCD, only 3.5 percent of the proposed Project area is developed (USDA SCA 2009). The majority of the land is cultivated crops (44 percent) and grassland (37.4 percent). The remaining is 8.5 percent pasture, 0.6 percent forest, 3.3 percent wetlands, and 2.7 percent open water.

3.7.4 Agriculture

Based on the 2007 Census of Agriculture, 90 percent (43,666,403 acres) of the total land area in the State of South Dakota is farmland, with an average farm size of 1,401 acres (USDA 2009). South Dakota ranked 17th in the U.S. in total value of agricultural products sold ($6.6 billion), with crop sales accounting for 51 percent and livestock sales accounting for 49 percent. The top crops in terms of acreage in the State include corn (4,455,368 acres), wheat (3,341,778 acres), hay (3,239,947 acres), and soybeans (3,222,872 acres). Land enrolled in the CRP, including the WRP, Farmable Wetlands Program (FWP) and Conservation Reserve Enhancement Program (CREP), in South Dakota totaled 1,599,477 acres in 2007, or 3.7 percent of farmland in the State.

In Brookings County, 91.2 percent (462,579 acres) of the total land area is farmland (USDA 2009). The average farm size in Brookings County (469 acres) is smaller in comparison to the State. The county ranked sixth of 66 counties in South Dakota for total value of agricultural products sold ($186,725,000), 47 percent of which was crop sales and 53 percent of which was livestock sales. The top crops in terms of acreage in Brookings County include corn (134,821 acres), soybeans (102,360 acres), hay (33,044 acres), and wheat (14,118 acres). There were 389 farms enrolled in CRP in 2007 in the county, totaling 41,381 acres (8.9 percent of all the farmland in the county).

In Deuel County, farmland accounts for 79.6 percent (317,164 acres) of the total land area in the county (USDA 2009). The average farm size in Deuel County is 544 acres. The county ranked 29th in the State for total value of agricultural products sold ($105,092,000). Crop sales accounted for 40 percent of this production value, and livestock sales accounted for 60 percent. The top crops in the county include corn (61,521 acres), soybeans (45,391 acres), hay (26,047 acres), and wheat (15,849 acres). In 2007, there were 315 farms enrolled in CRP in Deuel County, totaling 42,586 acres (13.4 percent of all farmland in the county).

The majority of land within the proposed Project area is farmland, and based on USDA-NASS Cropland Data, the top crops in terms of land area include corn (15,470 acres), soybeans (7,704 acres), and wheat (1,103 acres) (USDA SCA 2009). Based on correspondence with the FSA, there are not any sites within the proposed Project area that are enrolled in CRP or that have FSA mortgages. According to the NRCS, there are no easements administered by the agency within the proposed Project area.

There are four types of USFWS administered easements that occur within the proposed Project area, including conservation, grassland, WPA, and wetland. There are three conservation easements within the proposed Project area, totaling 550 acres. There are also three grassland easements (795 acres total), five

WPA easements (885 acres total), and seven wetland easements (709 acres total). None of these easements would be affected by the proposed Project.

3.8 TRANSPORTATION

The region of impact with respect to transportation includes the State and county highway network that would be used to deliver construction equipment, access for employees and deliveries during construction and operation of the proposed Project. White Site 1 is located near the intersection of 207th Street and 484th Avenue, roughly six miles southeast of the City of White. White Site 1 is approximately four miles south of SD 30 and four miles north of US 14. White Site 2 is located close to the intersection of 202nd Street and 482nd Avenue, about four miles east of the City of White and one mile north of SD 30.

Highways 14, 30, and 28 connect to Interstate 29, west of the site alternatives, at exits 132, 140, and 150, respectively. All highways are paved, two-lane roads maintained by the State Department of Transportation (DOT). The posted speed limits of the highways and interstate are 65 and 75 miles per hour (mph), respectively. Traffic volume data (average daily traffic, or ADT) on I-29 to the west ranges from 3,565 to 4,355, ADT values for US 14 range from 4,055 to 4,635, and ADT values for SD 30 range from 555 to 801. On other roads, values are much less and the majority of motor vehicle traffic is limited to local commuters and farm equipment.

A network of gravel or unimproved dirt roads provides access to the interior portions of the proposed Project area (table 3-11). The local roads follow section survey lines and are spaced one mile apart on north-south or east-west orientations.

Table 3-11: Road Network

North - South Roads	
Interstate 29	Concrete
478 Ave, 482 Ave (gravel north of 209 St), 486 Ave	Pave Asphalt
473 Ave, 474 Ave, 475 Ave, 476 Ave, 477 Ave, 479 Ave, 480 Ave, 481 Ave, 483 Ave, 484 Ave, 485 Ave (paved north of SD 30), 487 Ave	Gravel or Crushed Rock
East - West Roads	
US 14	Concrete
SD 28, SD 30	Pave Asphalt
195 St, 196 St, 197 St (paved asphalt from 478-SD/MN Border), 199 St (paved asphalt from 483B Ave - 487 Ave), 200 St (paved asphalt from 478 Ave - 483B Ave), 201 St, (paved asphalt from I-29 to 478 Ave), 202 St, 203 St, 204 St, 205 St, 206 St, 207 St, 208 St, 209 St (paved asphalt from I-29 to 476 Ave), 210 St, 211 St, 212 St, 213 St, 214 St, 216 St	Gravel or Crushed Rock

No regional or municipal airports are in the vicinity of the proposed Project area. The closest airport is in Brookings, approximately 14 miles southwest of White Site 1 and roughly 16 miles from White Site 2.

3.9 VISUAL RESOURCES

The Big Sioux Basin ecoregion has less topographic relief than the Prairie Coteau ecoregion, which has a more rolling, hilly appearance. The Prairie Coteau is also dotted with large and small lakes, which provide scenic diversity. The upper Deer Creek Valley, which cuts into the Prairie Coteau and extends all the way to Lake Hendricks, provides relatively greater topographic relief. Both the Big Sioux Basin and Prairie Coteau are rural, primarily cropland with a few scattered cattle operations. Occasional stands of trees are planted as windbreaks along the edges of fields or around the farmhouses. This flat to gently rolling area is punctuated by occasional farmsteads and barns and other agricultural outbuildings. Two substations, numerous transmission and distribution lines, and wind farms to the east and south now dominate the area. The nearest towns include White and Astoria.

3.10 NOISE

Sound is caused by vibration of air molecules and is measured on a logarithmic scale with units of decibels (dB). Sound is composed of various frequencies. Frequency is measured in Hertz (Hz), which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 Hz to 20,000 Hz. Typically, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the low and high frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in A-weighted decibels, (dBA). For reference, the A-weighted sound pressure level and subjective loudness associated with some common noise sources are listed in table 3-12.

Table 3-12: Typical Sound Pressure Levels Associated with Common Noise Sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 ft	
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 ft	
120	Threshold of feeling	Elevated train	Hard rock band
110		Jet flyover at 1000 ft	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 ft, auto horn at 10 ft, crowd noise at football game	
90		Propeller plane flyover at 1000 ft, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 ft	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner, electric typewriter
60	Moderate	Air-conditioner condenser at 15 ft, near highway traffic	General office
50	Quiet		Private office
40		Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Bedroom, average residence (without TV and stereo)
20		Rustling leaves	Quiet theater, whisper
10	Just audible		Human breathing
0	Threshold of hearing		

Source: Adapted from Egan 1988 and Ramsey and Sleeper 1994

It has been found that the A-scale weighting best approximates the frequency response of the human ear. The human ear responds to noises in the audible frequencies in a similar manner in most individuals. Most humans perceive the change in a noise level as follows:

- 3 dBA – Barely perceptible change
- 6 dBA – Readily perceptible change
- 10 dBA – Doubling (or halving) of the apparent loudness

There are also objective factors to consider when determining the noise and how people may be affected by the noise. Noise in the environment is constantly fluctuating, such as when a car drives by, a dog barks, or a plane passes overhead. Therefore, noise metrics have been developed to quantify fluctuating environmental noise levels. These metrics include the exceedance sound level (L_X). The L_X is the sound level exceeded "X" percent of the sampling period and is referred to as a statistical sound level. The most common L_X values are L_{eq}, L_{90}, L_{50}, and L_{10}. L_{eq} is the level of a constant sound over a specific time period that has the same sound energy as the actual sound over the same period. For this noise study, the most logical metric for noise measurements is L_{eq}.

The land in the vicinity of the proposed Project is generally used for agricultural and residential purposes. There are minimal noise sources in the area, with vehicular traffic, farming equipment, wind, and birds being the primary sources of existing sounds in the surrounding area. Accordingly, the background levels vary by time of day.

There are two substations located to the south of the proposed White Site 1 which would contribute to ambient noise levels at residences located close to the substations, primarily to the south of the proposed Project. Additionally, an existing wind farm is located approximately three miles east of the proposed Project and a proposed wind farm may be constructed to the west in the future. Because of the distance of the wind farms to the proposed Project, noise associated with the wind farms is not expected to contribute to ambient noise near the proposed Project.

An ambient noise survey was conducted for the community surrounding White Site 1. Background sound level measurements were taken during several time periods on May 19, 2009, and May 20, 2009, to capture the ambient sound levels near the proposed Project. Strong winds were present during each of the survey periods. High wind speeds generate higher noise levels as winds interact with vegetation and other nearby objects. These strong wind speeds are not uncommon in the proposed Project area. Sound level measurements were made at seven locations (figure 3-4). Each measurement was 5 minutes in duration. Noise measurements were not captured at three measurement points (MP2, MP3, and MP7) during three survey periods due to very high winds that were blowing dust into the microphone and meter. Because wind speeds were high during most measurements, when the wind was not blowing or was low, instantaneous noise levels were also recorded. This was done to determine noise levels during lighter wind conditions. Table 3-13 displays the L_{eq} noise level and minimum noise level that were captured during each measurement. Typical background noise levels for the project area range from 50 to 70 decibels.

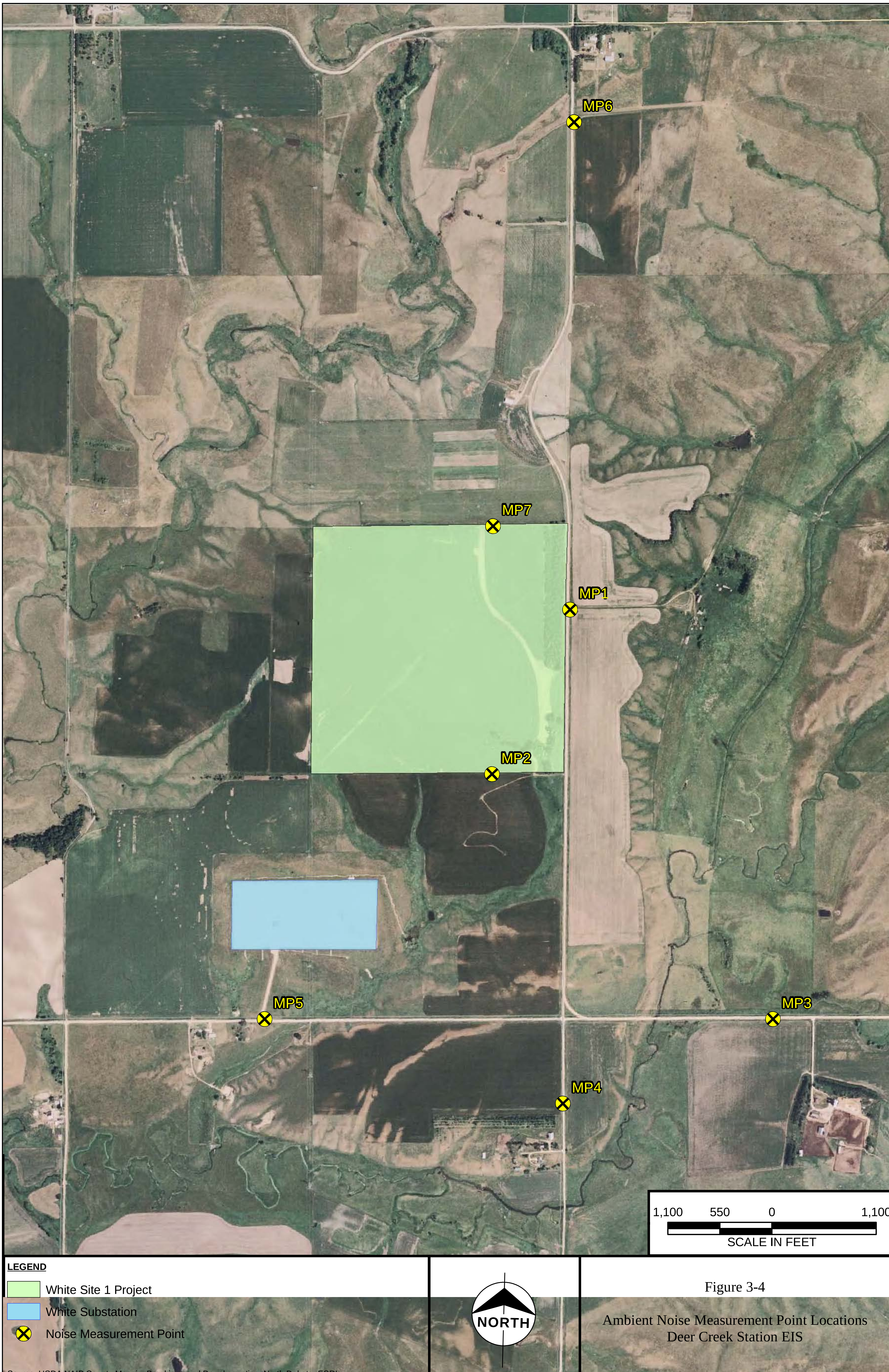

Figure 3-4

Ambient Noise Measurement Point Locations
Deer Creek Station EIS

Source: USDA NAIP County Mosaic, Brookings and Deuel counties, North Dakota; ESRI

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Table 3-13: Background Noise Levels

Measurement Point	Time Period	Measured L_{eq} (dBA)[1]	Minimum Measured Noise Level (dBA)	Extraneous Noises
MP1	6PM to 7PM	54	44	wind rustling trees and grass, birds
MP2	6PM to 7PM	--	--	
MP3	6PM to 7PM	--	--	
MP4	6PM to 7PM	57	44	wind rustling trees and grass, birds
MP5	6PM to 7PM	66	52	wind rustling trees and grass, birds, pole hitting fence
MP6	6PM to 7PM	59	43	Paper blowing, grass rustling, gate clanging, birds
MP7	6PM to 7PM	--	--	
MP1	11PM to 1AM	51	43	wind rustling trees and grass, creaking gate, slight insect noise
MP2	11PM to 1AM	55	48	wind rustling trees and grass, faint substations, frogs
MP3	11PM to 1AM	64	52	wind rustling grass
MP4	11PM to 1AM	56	42	wind rustling grass, frogs
MP5	11PM to 1AM	61	49	wind rustling trees and grass, frogs, pipe against gate
MP6	11PM to 1AM	49	39	wind rustling trees, wind howling through power lines
MP7	11PM to 1AM	52	42	wind rustling grass
MP1	6AM to 7AM	53	44	wind rustling trees and grass, gate clanging
MP2	6AM to 7AM	--	--	
MP3	6AM to 7AM	--	--	
MP4	6AM to 7AM	58	46	wind rustling trees and grass, birds
MP5	6AM to 7AM	61	49	wind rustling trees and grass, birds
MP6	6AM to 7AM	54	43	wind rustling trees and grass, birds
MP7	6AM to 7AM	--	--	
MP1	9AM to 11AM	53	47	wind rustling trees and grass, gate clanging, faint substation, faint birds
MP2	9AM to 11AM	--	--	
MP3	9AM to 11AM	--	--	
MP4	9AM to 11AM	65	50	wind rustling trees and grass, faint birds
MP5	9AM to 11AM	70	53	wind rustling grass, birds
MP6	9AM to 11AM	61	45	wind rustling trees and grass, gate clanging, faint birds
MP7	9AM to 11AM	--	--	

[1]Some measurements were not possible due to high winds blowing dust into the microphone.

3.11 PUBLIC HEALTH AND SAFETY

Public health and safety within and around both alternative sites depends on potential for hazards and risk. Occupational hazards include risks associated with construction and construction equipment, installation of equipment, heavy equipment transportation, and contact with electric lines. Potential public hazards include increased traffic volume due to construction vehicles in the area, and large construction vehicles and equipment using local roadways designed for lighter traffic.

Both proposed Project sites are located in a rural, agricultural area with low population density. Predominant activities are farm-related and include row crop production, livestock production, and haying. Access to private lands is restricted by landowners. Public safety is provided by local law enforcement or emergency response agencies. Fire services within the proposed Project area are provided by the White Volunteer Fire Department in White, South Dakota.

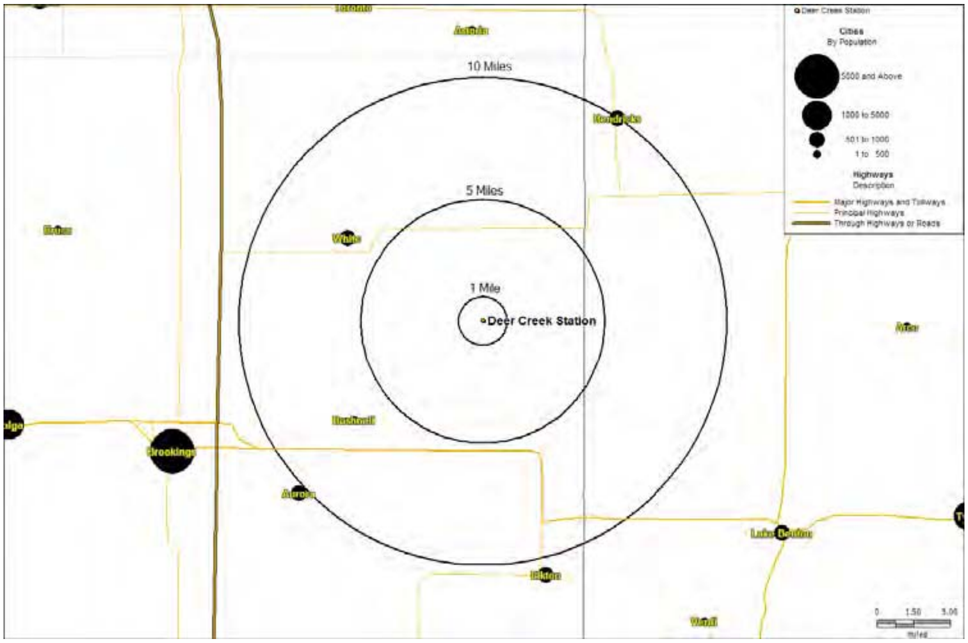
Although farming-related activities may use or produce hazardous materials within the proposed Project area of both sites (i.e. petroleum products used in farm machinery, herbicides/pesticides, and manure from large-scale cattle feeding operations), no specific occurrences or incidents regarding these hazards are known (EDAW 2009a). There is nothing to indicate that there are any existing unusual hazards to the environment within the proposed Project area.

3.12 INTENTIONAL DESTRUCTION

This section describes concentrated communities and resources within close proximity to the proposed Project. Population concentration and local resources are important considerations when evaluating the potential for intentional acts of destruction.

The proposed Project sites are located in eastern Brookings County, South Dakota. Two communities are between 5 and 10 miles from the proposed Project. The town of White has a population of less than 1,000 and the town of Bushnell has a population of less than 500. The towns of Hendricks, Aurora, and Elkton are approximately 10 miles from the proposed Project sites and have populations of less than 1,000. The city of Brookings is located approximately 14 miles from the proposed Project sites and has a population of approximately 20,000 (figure 3-5).

Figure 3-5: Proposed Site Proximity to Population Concentrations



The White Substation provides a connection between local power distribution lines and a Western 345-kV transmission line, which runs north and south. One local distribution line delivers power from the White Substation to the city of Brookings (southwest of the proposed site). Another local distribution line delivers power from the White Substation to communities directly east. The Western 345-kV transmission line provides power to Sioux Falls and surrounding communities, approximately 60 miles south of the proposed site.

The Northern Border Pipeline Co. interstate natural gas pipeline (42-in.) runs south and east and is located just north of Hendricks, MN. At its closest point, this pipeline is greater than 10 miles from the proposed site.

Brookings County relies exclusively on ground water from underground aquifers for safe drinking water and irrigation. In this area, there are shallow aquifers.

3.13 CULTURAL RESOURCES

3.13.1 Cultural History

Culturally the earliest occupation of this area is defined by archaeologists as the Early Prehistoric Period (10,000-3,000 B.C.), followed by the Middle Prehistoric Period (3000 B.C. to A.D. 900) and the Late Prehistoric (A.D. 900-1650) with subdivisions in each period. The period from A.D. 1650 to about 1800 is considered the protohistoric period by archaeologists. The historic period for the area is from A.D. 1800 to 1959.

Many Early Prehistoric sites are bison kill sites. Surface finds have been documented throughout the Region. The Middle Prehistoric Period exhibits a trend toward increased sedentism, intensified horticultural activity, expanding regional exchange networks, and elaboration of ceremonial activities and mortuary practices. Technological changes include the adoption of the bow and arrow and widespread use of ceramic vessels. In all cases, bison hunting remains the most important subsistence practice. Many of the sites appear to be short term seasonal occupations until the later part of the period when more and more groups experimented with plant domestication. The Late Prehistoric Period (A.D. 900-1650) sees major changes in ceramic, subsistence and settlement patterns, and differences in cultural orientations. This period shows influences from the Mississippian and Plains Village cultures. Most of the traditions identified for this period come from excavations along the Missouri River and the salvage work conducted during the 1950s before dams were constructed.

During the historic period, a number of peoples were known to pass through or trade in the area. These include the Cheyenne, Eastern or Santee Sioux (Mdewankanton, Wahpekute, Wahpeton, and Sesseton), the Middle or Wicheyela Sioux (Yankton and Yanktonai), the Western or Teton Sioux (Hunkpapa, Miniconjou, Blackfoot, Two-Kettle, Sansarc, Brule and Oglala), Arikara, Omaha, and Ponca.

Villages of the Omaha and Ponca were reported from the Big Sioux River to the south of the proposed Project. To the east, area residents would have found pipestone at the quarries in southwestern Minnesota and wood poles from the forest for lodge poles and other needs. When the French began trading with the people in the Dakotas it is known that the Teton Sioux would often travel to the James River to trade. The Arikara are Caddoan speakers and were documented as living on the Missouri River near the present day border of Nebraska and South Dakota in earth lodges. They continued to move upriver during the historic period mostly because of outbreaks of smallpox. It is likely they hunted in or passed through the proposed Project area.

Several locations near the proposed Project are associated with Sioux activities. The Oakwood Lakes, 22 miles to the west, were known by a Sioux name for the congregation of large herds of bison. Lake Benton, 16 miles to the east, was a location for collecting acorns. Deer Creek valley, adjacent to the Proposed Project, was known as *He Hdoka Sunkaku,* translated as Hole in the Mountain's Brother. This was a reference to a similarity between Deer Creek valley and one near Lake Benton. These areas were not identified during scoping as having cultural or religious significance to the tribes.

The Euro-Americans first explored the area as early as the 1630s. The early explorers of the Missouri River basin include Bourmont, the Mallet Brothers, and Truteau. The French occupied the territory on a limited basis into the eighteenth century. After the purchase of the area by the United States it was renamed the Louisiana Territory and later became the Missouri Territory after Louisiana became a State in 1812. The first official exploration of the territory was by Lewis and Clark.

Two major fur trading companies, the Hudson Bay Company and the North West Company, competed for trade throughout the territory. By the 1820s, the American Fur Company was coming into prominence in the Dakota Territory and several fortified posts were established along the Missouri River. One such post, Fort au Cedar or Old Fort George, was established along the Missouri River near the proposed Project at the mouth of Medicine Knoll Creek.

The military history of the area is generally associated with conflicts between the U.S. Government and the Native American or Indian population. One of the conflicts was close to the proposed Project. The Sioux Uprising of 1862 claimed the lives of between 450 and 800 whites and between 70 and 100 Sioux. Major battles were fought at New Ulm, Birch Coulee, and Wood Lake. The final battle was the Battle of Wood Lake; this was a decisive victory for the U. S. Army. The U.S. Army, militia, Yankton, and the raiding bands of Sioux, primarily Inkpaduta's band, repeatedly crossed through western Minnesota and eastern South Dakota. All of the Native Americans were eventually placed on reservations.

Much of eastern South Dakota was opened to Euro-American settlement in 1851 with the treaty of Traverse de Sioux. This early settlement was directly influenced by the railroads. The Great Dakota Boom in the 1880s led settlers from Norway, Germany, Russia, and other Midwesterners to establish homesteads in the eastern two-thirds of the Dakotas. Most of these settlers believed the climate was wet and humid due to unusual rains that occurred during this period. Many of these immigrants did not stay when the climate reverted to its normal dry cycle.

The opening of the settlement and establishment of towns in South Dakota is directly linked to railroad construction. Between 1878 and 1889, 285 towns were platted in South Dakota, of which 80 percent were found along rail lines. The remaining 20 percent were referred to as "inland towns" because they were not readily accessible. A section of the Chicago and Northwestern rail line that is close to or in the proposed Project area was constructed during 1879 and 1880 from Tracy, Minnesota to Pierre, South Dakota. Typical towns along the rail line were plotted in a T-shape with the rail line creating the crossbar of the T.

South Dakota is much the same today with the majority of towns and cities near the original rail lines. Agriculture and ranching are the primary subsistence. The outlying areas are sparsely populated but it is possible that early settlements may be found and dugouts and log structures may be found in or near the proposed Project.

3.13.2 Historic Properties in the Proposed Project Area

A historic property is any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP. An inventory of historic properties, including archaeological sites and historic structures was completed for those areas where construction and operational activities are proposed. Fifty-three total sites are included in the inventory; twelve of the sites have not been evaluated for listing in the NRHP, and five sites were determined eligible for listing in the NRHP. All of the recommended eligible sites are prehistoric in time period. None of the recommended eligible sites are near any potential construction or operational areas. One unevaluated site is located near the gas pipeline route, approximately one mile west of White Site 2. Tribal representatives of the following tribes were contacted by Western during scoping:

- Flandreau Santee Sioux
- Lower Sioux Indian Community of Minnesota
- Prairie Island Indian Community of Minnesota
- Santee Sioux Tribe of Nebraska
- Sisseton-Wahpeton Oyate
- Spirit Lake Tribe
- Upper Sioux Indian Community of Minnesota
- Yankton Sioux Tribe

No sites of cultural or religious significance were identified.

The White Site 1 Natural Gas Pipeline Route, White Site 1, and Water Well Supply Site B were further evaluated for cultural resources in detail. Sites investigated were abandoned farmsteads and prehistoric artifact scatters. None were determined eligible for inclusion in the NRHP. The archaeologists were accompanied by a tribal representative from the Sisseton-Wahpeton Reservation.

3.14 RECREATION

The proposed Project area for both sites consists of rolling prairies, agricultural lands, “prairie pothole” wetlands, lakes, ponds, and streams. There are many outdoor recreational opportunities in the region, with hunting, fishing, boating, and camping being the preferred activities for locals and tourists.

Numerous lakes and streams are found throughout the region. Lake Hendricks and Oak Lake are the largest lakes near to the alternative project sites, but there are other small lakes and ponds scattered throughout. Boating is popular on the larger lakes, and fishing opportunities are available on most lakes and streams. There is one South Dakota State park (Oakwood Lakes, 15 miles west of White), two State recreation areas (Lake Poinsett, 25 miles west of White; and Lake Cochrane, 10 miles north of Astoria), and one state natural area (Mound Springs Prairie, 15 miles north of Astoria) in the general vicinity. The parks and recreation areas offer boating, fishing, camping, and hiking opportunities (SDGFP 2009a). Mound Springs Prairie near Gary contains domed seepage wetlands, known as calcareous seepage fens. It is the largest remaining prairie complex in the Prairie Coteau. A city park with picnicking, swimming, and boating is located on Lake Hendricks. Oak Lake is a field station of South Dakota State University and is also used for recreation.

Hunting is a popular recreational activity in South Dakota, within the area of the proposed Project sites and in surrounding areas. Big game hunting for whitetail deer is popular, as well as upland game-bird hunting and waterfowl hunting. Much of the land within and surrounding the proposed Project areas is privately owned. However, there are Federal and State-managed public recreation areas in and around the proposed Project sites. WPAs are public hunting areas operated by the USFWS and exist to provide waterfowl hunters public access to enhanced waterfowl habitat. Areas within Brookings and Deuel counties are assigned to the Madison Wetland Management District. Game Production Areas (GPAs) are State-owned public hunting areas operated by the SDGFP and are managed for game production and public hunting access (SDGFP 2009b).

In addition to WPAs and GPAs, which are State and Federally owned properties, SDGFP provides Walk-In Areas (WIAs) for public hunting. WIA’s are privately owned parcels of land that are leased by the State to provide public hunting opportunities on WIA-enrolled parcels. Landowners are paid a yearly fee to enroll their property in the WIA program. A majority of land in the WIA program is enrolled in the CRP and provides quality habitat for pheasants, which is a popular quarry for hunters in South Dakota and within the proposed Project area (SDGFP 2009b). There are numerous WIAs in Brookings and Deuel counties, and several WIAs are located near the proposed Project sites.

Other recreational opportunities exist in and around the proposed Project. The City of Brookings, located approximately 14 miles to the southwest, provides many recreational and cultural opportunities such as golfing, theater, museums, shopping, and dining. In addition, there are numerous city parks located in Brookings and in neighboring communities surrounding the proposed Project (Brookings SD 2009).

No designated Wild and Scenic Rivers are located within the proposed Project area. However, the lower Big Sioux River 40 miles downstream is on the Nationwide Rivers Inventory of the National Park Service.

3.15 OTHER ACTIONS WITH POTENTIAL CUMULATIVE EFFECTS

Other actions are taking place in the Big Sioux River Basin and Prairie Coteau that affect the same resources impacted by the proposed Deer Creek Station. The following is a partial list of actions, and the resources potentially affected.

- White Wind Farm, Brookings County, water quality, wildlife
- Wind farm to south of plant, Brookings County, water quality, wildlife
- Yankee Substation to Brookings County Substation 115-kV transmission line project, water quality, wildlife
- Cropland erosion, all counties, Big Sioux and Lac Qui Parle watersheds
- Agricultural nutrients, Big Sioux and Lac Qui Parle watersheds
- Grassland conversion to agriculture, Big Sioux and Lac Qui Parle watersheds
- Sand and gravel mining, Brookings County, water quality in Deer Creek

* * * * *

4.0 ENVIRONMENTAL CONSEQUENCES

This section analyzes the potential impacts of Western's Federal action and Basin Electric's proposed Project and compares these impacts with the No Action Alternative. Under the No Action Alternative, Western would not approve an interconnection agreement to its transmission system, and RUS would not provide financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that Basin's proposed Project would not be built and the environmental impacts, both positive and negative, associated with construction and operation would not occur. It is noted that Basin Electric could decide to pursue interconnection with another transmission system, or the cooperative could explore other options to meet the underlying power demand, as discussed in Chapter 2.

If the interconnection agreement is approved and financing is provided, it is anticipated that Basin Electric would construct Deer Creek Station, a 300-MW combined-cycle natural gas-fired generation facility in Brookings County, South Dakota. Western would also need to make certain modifications within the existing White Substation in this case.

White Substation Impacts. The necessary improvements at the interconnection point at the White Substation would occur inside the developed area of the existing substation on Federal property. The site consists of a previously leveled and graded area covered with aggregate and having existing electrical equipment and bus work, inside a chain-link security fence. The layer of aggregate allows rapid drainage away from the surface and reduces "step and touch" electrocution hazard, but it also acts to reduce or eliminate vegetation within the substation. The substation is located in a rural area and is near two residences (approximately 3/4 mile away). There would be no substantive adverse impacts associated with the installation of additional equipment to allow the interconnection.

There would be minor, short-term impacts associated with the construction of the interconnection related to ground disturbance, primarily erosion/runoff, noise, and dust. These impacts are associated with construction activities that would occur primarily within the boundaries of the substation, would have negligible impacts to surrounding properties, and would be similar to impacts from local farming practices that occur in the area. Western's environmental quality protection construction standards (Western 2003) and BMPs would be employed to minimize erosion, sediment runoff, construction noise, and fugitive dust. The duration of the construction would be during approximately 3-6 months and would occur simultaneously with construction activities at the Deer Creek Station proposed Project. During operation, there would be negligible to minor noise impacts with the addition of the new transformer.

Because the impacts associated with the interconnection would occur within the boundaries of Western's White Substation, would be temporary and minor in severity, and could be effectively mitigated, the resultant impacts would be negligible to all environmental resources. No significant impacts would result from substation improvements. The remainder of the impact analysis in this chapter is devoted to the anticipated environmental impacts that would be associated with Basin Electric's proposed Project.

Basin Electric's Proposed Project. There are two alternative sites proposed for construction of the Deer Creek Station, White Site 1 and White Site 2. For White Site 1, the associated facilities would include an interconnection at the existing White Substation, a natural gas pipeline, and water supply wells. The White Substation is adjacent to White Site 1 and the impacts of a short transmission line connecting the two are included in the analysis of on-site impacts of the facility. For non-potable process water at the proposed Project, there were initially two water well supply sites considered for White Site 1, but Water Well Supply Site A did not provide a reliable ground water pumping rate. Therefore, the impacts of Water Well Supply Site B are emphasized in this analysis. White Site 1 would receive potable water from the rural water distribution line immediately adjacent to the county road that provides access to the site. White Site 1 also includes a natural gas pipeline route, designated the White Site 1 Natural Gas Pipeline Route. For White Site 2, the associated facilities would include a new on-site substation and transmission line interconnection with Western's system one mile to the east, a Rural Water Pipeline Extension west to 481st Avenue, and a natural gas pipeline route, designated the White Site 2 Natural Gas Pipeline Route. The two natural gas pipeline routes are discussed in sections where the pipeline would contribute to the total impacts of the proposed Project, such as water quality; the pipeline is not specifically discussed in sections where impacts of the pipeline would be *de minimis*, such as in air resources.

Basin Electric would comply with all Federal, State, and local laws and regulations that are applicable to its project. In addition, Basin Electric would incorporate BMPs and standard mitigation measures into its project to reduce and minimize the potential for adverse environmental impacts. Standard mitigation measures for air quality, water resources, geological resources, biological resources, land use, public health, visual resources, and noise to be used in the proposed Project are listed in appendix F.

4.1 AIR RESOURCES

Under the Clean Air Act (CAA) and its amendments, the EPA has established NAAQS for pollutants considered harmful to public health and the environment. The EPA has set NAAQS for seven principal, or "criteria", pollutants: NO_x, sulfur dioxide (SO_2), CO, ozone (O_3), particulate matter (PM) with an aerodynamic diameter less than 10 micrometers (PM_{10}), PM with an aerodynamic diameter less than 2.5

micrometers ($PM_{2.5}$), and lead (Pb). This section considers the potential for the proposed Project to comply with the NAAQS, as well as the potential to emit GHGs and HAP.

4.1.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no effects to air quality in the area associated with the No Action Alternative.

4.1.2 Proposed Project

The proposed Project sites are located southeast of White, South Dakota (population 530). The air quality analysis is applicable to either White Site 1 or White Site 2. For the purposes of this document, significance in air impacts is defined as:

- a violation of the NAAQS
- a violation of the National Emission Standards for Hazardous Air Pollutants (NESHAPs)

At this time, information on the effects of GHG emissions at a particular geographic location is incomplete or unavailable and a significance criterion has not been developed. With respect to GHG emissions, Western has identified the areas where information does not yet exist and relies on available information where it does exist. In accordance with this regulation, Western: (1) recognizes that information regarding impacts from GHGs is incomplete or unavailable, (2) recognizes that with the absence of this relevant information, it is unable to use available information to determine whether there are significant adverse impacts on the human environment, (3) has provided the relevant information regarding GHG emissions within the Final EIS, and (4) has discussed and evaluated the impacts of GHGs based upon theoretical approaches and generally accepted methods.

4.1.2.1 Construction and Growth-Related Emissions

Construction over a one and one-half year period on the proposed Project would have the potential for short-term adverse effects on air quality in the immediate area around the site. Diesel fumes from construction vehicles, delivery vehicles, and gas and water pipeline installation vehicles, and dust from site preparation and construction vehicle operation could affect local air quality during certain meteorological conditions. However, these instances would be limited in time and area of effect.

Emissions associated with the increase in vehicle miles traveled and emissions directly associated with the construction activities (e.g., grading, bulldozing, cranes, etc.) would increase overall air-shed emissions during the construction phase. The presence of temporary workers during the construction phase would likely cause a short-term demand for services in the area, including rental lodging, hotels, and restaurants. However, the construction phase would be temporary and would not contribute to permanent growth-related emissions in the area. Therefore, since the construction period would be short-term, the primarily transient work force would not contribute substantially to long-term growth-associated emissions. Following the construction phase, there would be approximately 30 permanent employees at the Deer Creek Station, many of which would be from the local community. These permanent jobs would not be expected to result in any substantive residential construction or construction-related emissions.

No significant industrial growth would be expected to accompany the proposed Project. Support services such as maintenance, cleaning, painting, and other related services already support existing industrial facilities in east-central South Dakota. Operating the Deer Creek Station would not be expected to trigger expansion of the existing support services industry in the area. The majority of growth-related emissions associated with the proposed Project would be expected to be related to the increased workforce (e.g., vehicle emissions associated with commuting). With respect to permanent employee vehicle emissions, it is anticipated that most workers would commute an average of 25 miles to the facility (First District Association of Local Governments 2009). Using emission factors summarized by EPA (1995), increased vehicle emissions associated with permanent employees at the proposed Deer Creek Station would be expected to be approximately 7.6 tons per year (tpy) CO, 1.4 tpy NO_x, and 1.0 tpy VOC. These emissions would be a tiny percentage of the emissions from the power plant facility and would not have the potential to violate the NAAQS.

4.1.2.2 NAAQS Emissions During Operation

As part of the air quality permitting process, the AMS/EPA Regulatory Model (AERMOD) was used to estimate downwind concentrations from single or multiple sources using meteorological data. AERMOD is the current EPA model used for modeling most industrial sources in Prevention of Significant Deterioration (PSD) permit applications and is an appropriate model for this type of facility. The PSD Permit Application was submitted in May 2009 (Sargent & Lundy 2009). The maximum predicted concentrations from the modeling analysis are less than the modeling and monitoring significance levels for each pollutant and averaging period (table 4-1). Therefore, the proposed Project would have insignificant impacts on the ambient air quality. Since the modeled maximum impacts are below their respective NAAQS significance levels, additional air quality modeling that compares impacts with NAAQS and PSD Increments was not required for the proposed Project.

Table 4-1: Air Quality Modeling Results and Standards ($\mu g/m^3$)*

Pollutant	Averaging Period	Maximum Modeled Impact	Modeling Significance	Monitoring Significance	NAAQS	PSD Increment
CO	1-hour	518	2000		40,000	
	8-hour	236	500	575	10,000	
NO_x	Annual	0.71	1	14	100	25
PM_{10}	24-hour	3.57	5	10	150	30
	Annual	0.12	1		50	17
$PM_{2.5}$	24-hour	26.6[1]			35	
	Annual	9.8[1]			15	

*Includes background concentration. Data source: Deer Creek PSD Application, May 29, 2009

4.1.2.3 Air Quality Impacts on Soils and Vegetation

Potential effects of NO_x and CO associated with the proposed Project on the nearby vegetation and soil were examined. Natural vegetation in Brookings and Deuel counties is tallgrass prairie and native vegetation is dominated by tall and mid grasses and forbs. Crops cultivated in the area include corn, soybeans, and small grains.

The potential effects of the air emissions to vegetation within the immediate vicinity of Deer Creek were evaluated by comparing modeled ambient air quality impacts to scientific research examining the effects of pollution on vegetation. Evaluations of impacts on sensitive vegetation were performed by comparing the predicted impacts attributable to the proposed Project with the screening levels developed by EPA (Smith and Levenson 1980). The screening procedure compares the maximum ambient concentrations associated with a proposed emissions source to the applicable screening concentrations. Maximum ambient air concentrations associated with the proposed Project were estimated using Class II ambient air quality impact modeling. Modeled ambient air quality impacts were compared to the EPA screening values. Concentrations in excess of any of the screening concentrations would indicate that the source might have adverse impacts on plants, soils, or animals. All potential impacts would be well below the screening levels. Most of the designated vegetation screening levels are equivalent to, or less stringent than, the NAAQS or PSD increments. Therefore, satisfaction of NAAQS and PSD increments also provides assurance that ambient air quality impacts would be below the sensitive vegetation screening levels.

Fugitive dust would pose a potential impact to local plant communities during construction, operation, and future maintenance. Fugitive dust is defined as dust that is not emitted from a definable point source. Construction equipment, travel on existing and newly constructed gravel access roads, and soil disturbance are all sources of fugitive dust. Fugitive dust can interfere with plant growth by obstructing stomata, thus reducing gas exchange with the environment, and reducing light interception. Fugitive dust associated with the proposed Project during construction activities would be negligible compared to that generated by farming activities in the surrounding areas, or wind pick-up from tilled fields. Dust impacts from construction and operation of the proposed Project would not be expected to be significant compared to other sources in the same area. Fugitive dust impacts were considered in the PSD permit application (Sargent & Lundy 2009) and would be addressed in the construction Storm Water Pollution Prevention Plan (SWPPP) prepared for the proposed Project. In order to minimize dust from Project activities, the following would be implemented for dust control, including the following:

- Limiting vehicle speeds on unpaved roads by posting signs along the construction route, clearly indicating the speed limit, placed so they are visible to vehicles entering and leaving the site of operations
- Applying an environmentally safe chemical soil stabilizer or chemical dust suppressant to the surface of unpaved roads, as needed, near residences along the primary construction traffic route
- Addition of road paving near the plant and at key intersections

4.1.2.4 Greenhouse Gases

No specific Federal, State, or regional GHG regulations apply to the proposed Project at this time, nor are there established standards to guide assessment of GHG emissions. CO_2 represents approximately 84 percent of all GHG emissions in the U.S. It is generated whenever a carbon-based fuel such as coal, wood, natural gas, or fuel oil is burned. It is the primary GHG emitted from fossil-fired utility boilers, with approximately 41 percent of U.S. man-made carbon emissions (primarily CO_2) coming from power plant sources (EPA 2009a). Other important sources are automobile and truck exhaust, industrial combustion sources, and residential heating sources. The operation of the 300-MW Deer Creek Station would release an estimated 1.02 million tons of CO_2 equivalent (0.93 million metric tons) into the atmosphere each year (table 4-2). Construction emissions were not estimated but would be a small fraction of the annual emissions from the plant. This may be compared to the total U.S. emissions of 7,150 million metric tons of CO2 equivalent in 2007 (EPA 2009a). The proposed Project would contribute an estimated three one-thousandths of one percent (0.00003) of world CO_2 emissions from global anthropogenic emissions (EIA 2008). As a further means of comparison, the projected annual emissions from the Project are 0.3 percent of the estimated 288 million tons of CO_2 emitted from wildfires during the period 2002-2006 (Wiedinmyer and Neff 2007). Using EPA's emissions equivalency calculator, the projected CO_2 emissions from the Project would be roughly equivalent to the annual CO_2 emissions from 168,191 passenger cars (EPA 2009c).

Western concludes that the proposed plant's emissions of CO_2 and other GHGs would have an undetermined effect on local, regional, or global climate change. Because numerous models produce widely divergent results, and there is insufficient information, Western is unable to identify the specific impacts of the proposed plant's CO_2 emissions on human health and the environment. Lack of sufficient information and the use of widely diverging models are evident in the IPCC report where it states in the Key Uncertainty section, "Difficulties remain in reliably simulating and attributing observed temperature changes to natural or human causes at smaller than continental scales. At these smaller scales, factors such as land use change and pollution also complicate the detection of anthropogenic warming influence on physical and biological systems. The same section also states, "Models differ considerably in their estimates of the strength of different feedbacks in the climate system, particularly cloud feedbacks, oceanic heat uptake, and carbon cycle feedbacks, although progress has been made in these areas." The lack of information and differences in predictive models have made it difficult for scientists and other experts to link a direct cause and effect of anthropogenic impacts of climate change on a global scale, much less on a local scale. As a result, Western believes that any attempt to analyze and predict the local or regional impacts of the proposed plant's CO_2 emissions on human health and the environment cannot be done in any way that produces reliable results.

However, Western did provide comparisons of the projected CO_2 emission rate from the proposed Project to other technologies, existing regional levels, and regulatory levels. Western believes the discussion provided in this section provides the relevant information regarding CO_2 and climate change issues of pubic interest.

Table 4-2: Estimated GHG Emissions from Operation of the Proposed Project

Emission Unit	Size	hr/yr	CO_2 Emission Factor	CH_4 Emission Factor	N_2O Emission Factor	Reference	CO_{2eq} lb/hr	CO_{2eq} tpy
Combustion Turbine	1434 MMBtu/hr	8,760	110 lb/MMBtu	0.0086 lb/MMBtu	0.003 lb/MMBtu	AP42 chapter 3.1 dated 4/00	159,333	697,877
HRSG and Duct Burner	610.4 MMBtu/hr	8,760	120 lb/MMBtu	0.0023 lb/MMBtu	0.0022 lb/MMBtu	AP42 chapter 1.4 dated 7/98	73,694	322,779
Heater	25 MMBtu/hr	150	120 lb/MMBtu	0.0023 lb/MMBtu	0.0022 lb/MMBtu	AP42 chapter 1.4 dated 7/98	3,018	226
Diesel Generator	22.53 MMBtu/hr	150	164 lb/MMBtu			AP42 chapter 3.3 dated 10/96	3,695	277
Diesel Fire Pump	577 hp	150	1.15 lb/hp hr			AP42 chapter 3.3 dated 10/96	664	50
Total: 1,021,430 tons CO_{2eq}								

Source: EPA 1995 and updates

4.1.2.5 Hazardous Air Pollutants

Section 112 of the CAA requires EPA to list categories and subcategories of major sources of hazardous air pollutants (HAPs), and to establish NESHAPs for each source category. The NESHAP regulations, codified under 40 CFR Parts 61 and 63 and incorporated in to the South Dakota Air Pollution Control Program at Chapter 74:36:08, are designed to regulate specific categories of stationary sources with the potential to emit one or more HAPs.

Each combustion source at the proposed Project would emit some level of HAPs. Emissions of HAPs were estimated based on fuel characteristics, heat input to each combustion source, and the applicable AP-42 emissions factors (EPA 1995). Based on emission calculations, total potential HAP emissions from all sources at the Deer Creek Station would be less than 25 tpy (table 4-3). Formaldehyde is the individual HAP constituent that would be emitted in the greatest quantity. Based on emission calculations, potential formaldehyde emissions from all emission sources would be 4.51 tpy. Emissions of other HAPs are much less than those of formaldehyde and minimal in quantity and impact (table 4-3). Because the facility does not have the potential to emit any single HAP at a rate greater than 10 tpy, or any combination of HAP at a rate of 25 tpy or more, the proposed Project does not meet the definition of a major source of HAP emissions and the NESHAP regulations do not apply to emission sources at the proposed Project. In summary, all construction and operation air emissions from the proposed Project would meet the NAAQS. Emissions of HAPs would be minimal in quantity and in impact.

4.1.3 Cumulative Air Quality Effects

The air quality modeling took into account current ambient air conditions; therefore, the impacts of past contributors to air quality impacts in the area have been considered. The receptor grid for the modeling extended 10 km (6 miles) from the facility fence line, and the visibility analysis extended 50 km (30 miles) to include Pipestone National Monument and several state parks. A coal-fired power plant previously proposed for northeastern South Dakota has been formally cancelled. The proposed Project meets the NAAQS and the air quality modeling took into account the cancelled Big Stone II project, in addition to the Deer Creek Station proposed Project. On an individual or cumulative basis, neither the proposed Project nor Big Stone II would violate the NAAQS. Accordingly, the proposed Project, in combination with the Big Stone II Project (since cancelled), would not significantly affect regional air quality on a cumulative basis.

Table 4-3: Estimated HAP Emissions from the Proposed Project

Pollutant	Combustion Turbines		Duct Firing		Diesel-Fired Water Pump		Inlet Air Heater		Diesel Generator		Total	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
1,3-Butidiene					1.74E-04	1.30E-05					1.74E-04	1.30E-05
2-Methylnaphthalene*							6.00E-07	4.50E-08			6.00E-07	4.50E-08
Acenaphthene					6.32E-06	4.74E-07			1.05E-04	7.91E-06	1.11E-04	8.38E-06
Acenaphthylene					2.25E-05	1.69E-06			2.08E-04	1.56E-05	2.31E-04	1.73E-05
Acetaldehyde	5.74E-02	2.51E-01			3.41E-03	2.56E-04			5.68E-04	4.26E-05	6.14E-02	2.51E-01
Acrolein	9.18E-03	4.02E-02			4.12E-04	3.09E-05			1.78E-04	1.33E-05	9.77E-03	4.02E-02
Anthracene					8.32E-06	6.24E-07			2.77E-05	2.08E-06	3.60E-05	2.70E-06
Arsenic			1.20E-04	1.44E-04			5.00E-06	3.75E-07			1.25E-04	1.44E-04
Benzene	1.72E-02	7.54E-02	1.26E-03	1.51E-03	4.15E-03	3.11E-04	5.25E-05	3.94E-06	1.75E-02	1.31E-03	4.02E-02	7.85E-02
Benzo(a)anthracene					7.48E-06	5.61E-07			1.40E-05	1.05E-06	2.15E-05	1.61E-06
Benzo(a)pyrene					8.37E-07	6.27E-08			5.79E-06	4.34E-07	6.63E-06	4.97E-07
Benzo(b)fluoranthene					4.41E-07	3.31E-08			2.50E-05	1.88E-06	2.54E-05	1.91E-06
Benzo(g,h,i)perylene					2.18E-06	1.63E-07			1.25E-05	9.40E-07	1.47E-05	1.10E-06
Benzo(k)fluoranthene					6.90E-07	5.17E-08			4.91E-06	3.68E-07	5.60E-06	4.20E-07
Beryllium			7.18E-06	8.61E-06			3.00E-07	2.25E-08			7.48E-06	8.63E-06
Cadmium			6.58E-04	7.89E-04			2.75E-05	2.06E-06			6.86E-04	7.91E-04
Chromium			8.37E-04	1.00E-03			3.50E-05	2.63E-06			8.72E-04	1.00E-03
Chrysene					1.57E-06	1.18E-07			3.45E-05	2.59E-06	3.61E-05	2.71E-06
Cobalt			5.02E-05	6.03E-05			2.10E-06	1.58E-07			5.23E-05	6.05E-05
Dibenz(a,h)anthracene					2.59E-06	1.95E-07			7.80E-06	5.85E-07	1.04E-05	7.80E-07
Dichlorobenzene			7.18E-04	8.61E-04			3.00E-05	2.25E-06			7.48E-04	8.63E-04
Ethylbenzene	4.59E-02	2.01E-01	0.00E+00	0.00E+00							4.59E-02	2.01E-01
Fluoranthene*			1.26E-03	1.51E-03	3.39E-05	2.54E-06	7.50E-08	5.63E-09	9.08E-05	6.81E-06	1.38E-03	1.52E-03
Fluorene*					1.30E-04	9.75E-06	7.00E-08	5.25E-09	2.88E-04	2.16E-05	4.18E-04	3.14E-05
Formaldehyde	1.02E+00	4.46E+00	4.49E-02	5.38E-02	5.25E-03	3.94E-04	1.88E-03	1.41E-04	1.78E-03	1.33E-04	1.07E+00	**4.51**
Hexane			1.08E+00	1.29E+00			4.50E-02	3.38E-03			1.13E+00	1.29E+00
Indeno(1,2,3-cd)pyrene					1.67E-06	1.25E-07			9.33E-06	7.00E-07	1.10E-05	8.25E-07
Lead			2.99E-04	3.59E-04			1.25E-05	9.38E-07			3.12E-04	3.60E-04
Manganese			2.27E-04	2.73E-04			9.50E-06	7.13E-07			2.37E-04	2.74E-04
Mercury			1.55E-04	1.87E-04			6.50E-06	4.88E-07			1.62E-04	1.87E-04
Napthalene	1.86E-03	8.17E-03			3.77E-04	2.83E-05	1.53E-05	1.14E-06	2.93E-03	2.20E-04	5.18E-03	8.42E-03

Pollutant	Combustion Turbines		Duct Firing		Diesel-Fired Water Pump		Inlet Air Heater		Diesel Generator		Total	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Nickel			1.26E-03	1.51E-03							1.26E-03	1.51E-03
Phenananthrene*			4.49E-02	5.38E-02	1.31E-04	9.81E-06	4.25E-07	3.19E-08	9.19E-04	6.89E-05	4.60E-02	5.39E-02
Propylene					1.15E-02	8.61E-04					1.15E-02	8.61E-04
Pyrene*			2.03E-03	2.44E-03	2.13E-05	1.60E-06	1.25E-07	9.38E-09	8.36E-05	6.27E-06	2.14E-03	2.45E-03
Selenium			1.44E-05	1.72E-05			6.00E-07	4.50E-08			1.50E-05	1.72E-05
Toluene	1.86E-01	8.17E-01	2.03E-03	2.44E-03	1.82E-03	1.37E-04	8.50E-05	6.38E-06	6.33E-03	4.75E-04	1.96E-01	8.20E-01
Xylene	9.18E-02	4.02E-01			1.27E-03	9.51E-05			4.35E-03	3.26E-04	9.74E-02	4.02E-01
Total HAP Emissions	**1.43**	**6.26**	**1.13**	**1.35**	**0.03**	**0.0021**	**0.05**	**0.0035**	**0.03**	**0.0025**	**2.72**	**7.67**

Source: Deer Creek PSD Application, May 29, 2009

4.2 GEOLOGY, SOILS AND FARMLAND

4.2.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no effects to geology, soils, and farmland in the area associated with the No Action Alternative.

4.2.2 Proposed Project

Impacts to geology, soils, or farmland would be considered significant if:

- A loss of unique geologic, mineral, or soil resources not available in other locations occurred
- More than one percent of the prime farmland within a county is taken out of production as a result of the proposed Project

The geologic resources at White Sites 1 and 2 are Quaternary Period glacial deposits of sand, gravel, and alluvial material. These geological features are common in the area, and there are no unique geological features at the two sites or along the pipeline or transmission corridors. If sources of gravel and fill are required during the proposed Project, the areas would be identified and documented. Sand and gravel deposits are uncommon within the soils that are found on White Site 1, White Site 2, and associated facilities. However, there are gravel quarries in the area, and the potential for gravel deposits would have to be confirmed by a site-specific investigation.

Prime farmland soils exist in the proposed Project area and would be affected by construction. Impacts to agriculture would include the removal of farmland, primarily for plant construction at either White Site 1 or 2 (about 100 acres in either alternative). This land would no longer be available for agricultural use for the life of the proposed Project. Cultivated croplands disturbed by construction and not permanently impacted by the proposed Project would be available for continued agricultural uses. This includes virtually all land affected by natural gas and water pipeline construction, transmission lines, or the Water Well Supply Site. A 200-foot-by-200-foot area for the Water Well Supply Site would be fenced. Permanently converted acreage would represent a very small percentage of the total 462,579 acres of farmland in Brookings County and 317,164 acres in Deuel County. This loss of farmland would not significantly affect the overall agricultural production in the county. The total value of agricultural products sold in 2007 was $186.7 million in Brookings County and $105.1 million in Deuel County. It is estimated that the loss in agriculture revenue in Brookings County as a result of the proposed Project would comprise a negligible percentage of these totals. In addition, the loss would be offset by new full-time jobs, payments to landowners for the property and easements, and general societal benefits of additional electrical resources.

Almost all land removed from agricultural production as a result of the proposed Project would be prime farmland. Virtually all well-drained level land in the region that would be suitable for a power plant site is prime farmland. Most impacts would be a result of plant construction at either White Site 1 or White Site 2. At White Site 1, although the plant footprint would be 40 acres, approximately 100 acres would be fenced and not available for cropland use. This property is currently in agricultural production and contains soils classified as prime or statewide important farmland, except for about five percent of the northeast corner of the site. At White Site 2, the plant and substation footprint would be 46 acres. Approximately 100 acres would be fenced and not available for cropland use. Table 4-4 and table 4-5 list the soils on White Site 1 and White Site 2, respectively.

Table 4-4: Soil and Farmland Impacts, White Site 1

Soil Symbol	Soil Name	Farmland Classification
BoE	Buse-Langhei complex, 15 to 40 percent slopes	not prime or important farmland
DoB	Doland loam, 2 to 6 percent slopes	all areas are prime farmland
EsA	Estelline silt loam, 0 to 2 percent slopes	all areas are prime farmland
Mu	McIntosh-Lamoure silty clay loams, 0 to 2 percent slopes	prime farmland if drained
StB	Strayhoss-Maddock complex, 2 to 6 percent slopes	prime farmland if irrigated
VaB	Venagro-Svea loams, 1 to 6 percent slopes	all areas are prime farmland
VnC	Vienna-Buse complex, 6 to 9 percent slopes	farmland of statewide importance

Source: USDA 2009

Table 4-5: Soil and Farmland Impacts, White Site 2

Soil Symbol	Soil Name	Farmland Classification
BbA	Barnes clay loam, 0 to 2 percent slopes	all areas are prime farmland
BbB	Barnes clay loam, 2 to 6 percent slopes	all areas are prime farmland
Hb	Hamerly-Badger complex, 0 to 2 percent slopes	prime farmland if drained
Mu	McIntosh-Lamoure silty clay loams, 0 to 2 percent slopes	prime farmland if drained

Source: USDA 2009

The natural gas and water pipelines, transmission facilities, and water well supply sites would involve prime farmland but would not permanently remove farmland from production, except for a 200- by 200- foot area of the water well supply site or the immediate area of transmission structures. Soils disturbed within the natural gas and water pipeline corridors would be contained within a 75-foot wide construction easement where equipment would be used to construct the trench and bury the facility. The actual disturbance area would be less than the 75-foot wide easement along much of the corridor. Permanent impact would be limited to the width of the trench. Typical construction diagrams for trenching and directional drilling are provided in appendix G. During actual trench construction, topsoil would be removed separately, stockpiled until the pipeline is installed, and the topsoil replaced at the top of the fill to minimize productivity impacts. Outside of the immediate trench construction area, some temporary soil compaction would be expected from trucks and construction equipment. There would be little permanent impact to the soils along the path of the White Site 1 Natural Gas Pipeline Route, White Site 2 Natural Gas Pipeline Route, White Site 1 Transmission Line, White Site 2 Transmission Line, or Rural Water Pipeline Extension.

A Farmland Conversion Impact Rating Form (Form AD-1006) was completed in coordination with the NRCS. Less than one percent of the 441,708 acres of prime and important farmlands in Brookings County would be impacted.

4.2.3 Cumulative Effects

Past, present, and reasonably foreseeable future actions that have the potential to cumulatively impact the geological and soil resources found in the Big Sioux Basin and Prairie Coteau include past sod-busting and gravel mining, as well as past and present wind farm construction to the east and west of White Site 1 and 2. However, wind farm construction does not generally remove farmland from production, and the construction of the plant site, when added to the area of other proposed activities, would remove a tiny fraction (much less than one percent) of farmland from production in the area. There is little suburbanization or other pressure to convert farmland to non-farm usage in the area. No unique geologic, soil, or mineral resources would be affected by the proposed Project. Thus, on an individual or cumulative basis, the proposed Project would not significantly affect soil or geological resources.

4.3 WATER QUALITY, FLOODPLAIN, AND GROUNDWATER RESOURCES

4.3.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no water quality, floodplain, or groundwater impacts associated with the No Action Alternative.

4.3.2 Proposed Project

Construction of the proposed Project at either White Site 1 or White Site 2 would have similar impacts to water resources, although the construction of a facility at White Site 1 would involve a water supply well and water pipeline, while construction at White Site 2 would involve a water tap and pipeline to connect to an existing municipal water supply service. Impacts to water resources would be considered significant if:

- The Proposed Project would cause an increase in susceptibility to on- or off-site flooding due to altered surface drainage patterns or stream channel morphology
- Withdrawal levels would cause established users to curtail operations
- Erosion would result in long-term impacts to water quality
- The proposed Project would violate the terms and conditions of the SWPPP, SDDENR section 401 CWA certification, section 404 CWA permit provisions, or the Brookings or Deuel County Erosion and Sediment Control Plans
- Groundwater withdrawal from construction dewatering or wells would affect current users of designated Well Head Protection Areas or stream water levels near the water supply well site

4.3.2.1 White Site 1

The construction and operation of various proposed Project components at White Site 1 would potentially result in both construction- and operation-related impacts to water resources. This includes construction of the power generation facility, access roads, and transmission line construction. In addition, well water used in plant processes would be tested to ensure that it meets water quality standards and discharged into a tributary to Deer Creek. On-site collected stormwater would also be discharged into a Deer Creek tributary. There would not be a water intake, as the cooling water would come from groundwater wells.

4.3.2.1.1 Surface Water

The excavation and exposure of soil on White Site 1 could cause sediment runoff during rain events. It is unlikely that construction within cultivated fields would contribute to additional sediment runoff because such areas periodically consist of exposed soils. Thus, impacts from the proposed Project would primarily be limited to areas that are currently uncultivated. In all disturbance areas, BMPs would be used to prevent sediment from leaving the construction site. The operating area of the proposed Project would be graded so that stormwater would be directed to drainage ditches and swales and then to an on-site stormwater detention pond. The plant site would consist of paved areas, aggregate covered areas, and mowed grass. The water would meet the water quality discharge criteria established in the NPDES permit issued by the SDDENR. The pond would only be discharged after the collection water met the water quality limits imposed by the FPDES permit issued by SDDENR. The water treatment reject water would flow off site in the same system of drainages as the stormwater pond discharge.

Water quality would be affected by the acreage of disturbance and its location during construction and operation of the proposed Project. BMPs such as silt fences, erosion control blankets, and straw waddles would be installed to ensure that sediment or fill material does not impact nearby waterways. Proper implementation of a SWPPP and adherence to local and State regulations involving sediment-laden runoff would ensure that construction activities that remove vegetation and disturb soils would not have a significant impact to water quality. Once construction ceases the site would be stabilized by grass or aggregate surfaces before any erosion and sediment controls are removed.

Other impacts to surface water are possible if spills of chemicals were to occur during construction activities. In order to mitigate the impact of possible chemical spills, spill prevention and control would be required, and specific measures described in the SWPPP. Spill plan measures would include spill containment materials at all construction sites and site crews trained in spill response and clean up. The proposed Project would adhere to regulations and permits governing storm-water pollution prevention for sediment control, including those governed by the NPDES.

There is a receiving stream on the White Site 1 property that could potentially receive runoff. This stream is a tributary of Deer Creek. With effective use of BMPs, minimal impacts to water quality are expected. A silt fence and sediment barriers would be placed where disturbance takes place and vegetation would be established before any erosion control measures are removed. A vegetated barrier with a buffer zone of 25 feet would be in place to help catch and treat any runoff that takes place in close proximity to the stream.

4.3.2.1.2 Floodplains

According to FEMA's 100-year flood zone maps, there are no 100-year flood zones in the White Site 1 property.

4.3.2.1.3 Groundwater

White Site 1 does not overlie Brookings County Well Head Protection Areas. However, groundwater impacts are possible if there is construction dewatering. This may be needed if localized pockets of saturated subsurface soils or groundwater are encountered during construction. A Dewatering Permit from the SDDENR would be required before construction dewatering can occur. During dewatering operations, any water extracted would be dealt with appropriately to protect water quality. Any impacts or effects to groundwater would be small, and localized water table depressions would not remain after completion of construction. The impacts to groundwater are thus expected to be temporary and unlikely to affect water wells.

4.3.2.2 Water Well Supply Site B and Water Pipeline

4.3.2.2.1 Surface Water

Deer Creek flows through the Water Well Supply Site B property and could potentially receive sediment-laden runoff. Silt fence and sediment barriers would be placed along the water pipeline route where disturbance would take place and vegetation would be re-established before any erosion control measures are removed. A vegetated barrier with a buffer zone would be in place to help catch and treat any runoff that takes place in close proximity to the stream that parallels 484th Avenue between 207th Street and White Site 1. With the use of BMPs, minimal impacts to water quality from the well drilling activity would be expected.

Also, a bridge over Deer Creek on 484th Avenue adjacent to Water Well Supply Site B would be improved for use by heavy loads by placement of a jumper bridge over the existing bridge. No work in streams would be required; however, BMPs would be used to avoid runoff impacts to waterways.

4.3.2.2.2 Floodplains

According to FEMA's 100-year flood zone maps, the floodplain of Deer Creek includes the southern portion of Water Well Supply Site B. Approximately 45.5 acres of the 160-acre site, or about 30 percent, is within the limits of the 100-year floodplain. A production test water well site with adequate aquifer recharge has been located immediately to the west of 484th Avenue just to the south of 207th Street. It is within the 100-year floodplain of Deer Creek. Total impacts to the floodplain would include an approximately 200-foot-by-200-foot area for two individual wellheads, a monitoring well, and an 8-foot by 10 foot control building. The access road, wells, and control building would be contoured to an elevation one foot above the 100-year flood elevation. Consistent with the requirements of the National Flood Insurance Program, the building would be watertight and utilities would be made capable of resisting flood damage. Because all other available water well supply sites are located within the Deer Creek floodplain, there is no practicable alternative to locating this facility within the floodplain if White Site 1 is chosen for implementation.

4.3.2.2.3 Groundwater

Zone A areas protect public water supply wells. Zone B areas delineate aquifers that are potential sources of future groundwater development. Water Well Supply Site B is in zone "B" of the Brookings County Well Head Protection Area and is not in a public water supply Zone A area. A water well would be a permitted use in the Zone B area.

Groundwater pumping in a designated Zone B area would occur for the two production wells needed for the power plant. Each well would be capable of pumping 125 gallons per minute (gpm) through a 10-inch diameter casing. Each well is capable of meeting the water use requirements of the proposed Project. Only one well would be in service at a time. The second well is needed to provide an alternative water supply when a well is out of service for maintenance. For the Big Sioux Aquifer, the cone of influence based on this pumping rate is estimated to vary between 21 and 135 feet. The estimated annual average use is estimated to be six million gallons or 18 acre-feet. The wells would be installed approximately 280 feet from Deer Creek but in the Deer Creek floodplain. The wells would be located within the 200-foot-by-200-foot well site area. A total of five monitoring wells would be installed on a temporary basis to confirm impacts to the aquifer. One monitoring well would be installed within 50 feet of each of the two production wells to determine the effects of the pumping on the nearby aquifer. In addition, three additional monitoring wells would be installed to monitor the impacts of the production wells on Deer Creek. One well would be installed across the road between the production well and Deer Creek. The other two temporary monitoring wells would be installed south of the production wells, between the wells and Deer Creek. The temporary wells would be removed if monitoring shows that the temporary wells are not within the production well's cone of influence.

Pump tests indicate an abundant water supply for power plant consumptive uses (emission control and cooling water), and the productive nature of the wells indicates a low potential to affect nearby groundwater resources. Basin Electric performed a site-specific aquifer hydrologic assessment study to identify the aquifer characteristics. The aquifer thickness at the drilling site was found to be 43 feet. The aquifer was pumped at 30 gallons per minute for six consecutive hours, during which the water elevation decreased by two feet. Within two minutes of the end of pumping, the water elevation had returned to its original level (Banner Associates 2009). There are no current competing users for the groundwater resource in the immediate vicinity of White Site 1.

4.3.2.3 White Site 2

The construction and operation of various proposed Project components at White Site 2 would potentially result in both construction- and operation-related impacts to water resources. This includes construction of the power generation facility, access roads, Rural Water Supply Line, and White Site 2 Transmission Line construction. In addition, there would be a water discharge point on a tributary to Deer Creek for process water. The water would be tested and treated prior to discharge to ensure that it meets water quality standards. There would not be a water intake, as the cooling water would come from the rural water supply.

4.3.2.3.1 Surface Water

Within the White Site 2 site, there is a stream that could potentially receive runoff. Because sediment and erosion control measures would be required, only minimal impacts to water quality would be expected. Silt fence and sediment barriers would be placed along the route where disturbance takes place and vegetation would be established before any erosion control measures are removed. A vegetated barrier of 25 feet with a buffer zone would be in place to treat any runoff that takes place in close proximity to the stream. White Site 2 would have a larger amount of permanent surface changes and potential surface runoff than White Site 1 due to the additional construction of the necessary substation. Along the White Site 2 Transmission Line, impacts would be minimal with the proper placement of BMPs along the route. Along the Rural Water Pipeline Extension west to 481st Avenue, impacts would be minimal with the proper placement of BMPs.

4.3.2.3.2 Floodplains

According to FEMA's 100-year flood zone maps, there are no 100-year flood zones within White Site 2, the Rural Water Pipeline Extension, or White Site 2 Transmission Corridor.

4.3.2.3.3 Groundwater

White Site 2 does not overlie established Brookings County Well Head Protection Areas. Use of rural water supply would not result in new groundwater impacts; however, there could be water withdrawal impacts at the source of the water.

Groundwater impacts are also possible if there is construction dewatering. This may be needed if localized pockets of saturated subsurface soils or groundwater are encountered during construction. A Dewatering Permit from the SDDENR is required before construction dewatering can occur.

During dewatering operations, any water extracted would be dealt with appropriately to protect water quality. Any impacts or effects to groundwater would be small, and localized water table depressions would not remain after completion of construction. The impacts to groundwater are thus expected to be temporary and unlikely to affect water wells.

4.3.2.4 White Site 1 Natural Gas Pipeline

4.3.2.4.1 Surface Water

Within the White Site 1 Natural Gas Pipeline Route, the pipeline would be trenched except where wetlands over 0.5 acres occur. In the case of these larger wetlands, the pipeline would be directionally drilled. Every effort would be taken to minimize the potential for sediment-laden runoff to enter streams or roadside ditches. With appropriate use of BMPs, minimal impacts are expected. Silt fence and sediment barriers would be placed along the route where disturbance takes place and vegetation would be established before any erosion control measures are removed (70 percent native perennial vegetative cover). In addition, construction would take place in the fall when conditions are likely to be driest; potential runoff would be less during re-contouring and seeding. Construction work would take place adjacent to county and township roads, thus limiting disturbance of additional property in accessing the project site.

4.3.2.4.2 Floodplains

According to FEMA's 100-year flood zone maps, the White Site 1 Natural Gas Pipeline Route crosses and runs parallel to 100-year flood zones at several locations. The pipeline makes eight crossings of 100-year flood zones. The central region of the pipeline route crosses an extensive section of floodplain because it runs parallel to Deer Creek and the Lac Qui Parle River along 485th Avenue to the south of Lake Hendricks. The approximate lengths (in feet) of each floodplain crossing are listed in order from north to south in table 4-6. The White Site 1 Natural Gas Pipeline Route crosses a total of approximately 4,607 linear feet of 100-year flood zone areas.

Table 4-6: Gas Pipeline FEMA Floodplain Crossings

Floodplain Name	Approximate Linear Feet of Pipeline Crossing
White Site 1 Natural Gas Pipeline Route	
Crossing 1	275
Crossing 2	395
Crossing 3	396
Crossing 4	134
Crossing 5	169
Crossing 6	378
Crossing 7	638
Crossing 8	2,222
Total Linear Feet Crossed	**4,607**
White Site 2 Natural Gas Pipeline Route	
Crossing 9	377
Crossing 10	436
Crossing 11	644
Total Linear Feet Crossed	**1,457**

The location of the White Site 1 Natural Gas Pipeline Route in relation to floodplains is indicated in figure 4-1. The pipeline would be buried and would not create permanent floodplain obstructions. Accordingly, natural and beneficial floodplain values would only be affected during a brief construction period and periodically during the operation period when repairs or maintenance activities are needed. BMPs would be used to prevent sediment-laden runoff during the construction period, and disturbed areas would revegetate quickly. The White Site 1 Natural Gas Pipeline Route follows roadways in order to minimize the potential for impacts to environmental resources. The crossings of floodplains, with the exception of a section paralleling Deer Creek along 485th Avenue, are perpendicular to the streams, thus minimizing disturbance within the floodplain. In order for a pipeline to be routed to White Site 1, floodplain crossings are necessary (table 4-6). There are no pipeline routes that would completely avoid floodplains, given the locations that existing pipelines would need to be tapped, the alternative site locations, and the drainage patterns in the region. As a result of these considerations, there is no practicable alternative to construction of a natural gas pipeline in the floodplain crossings.

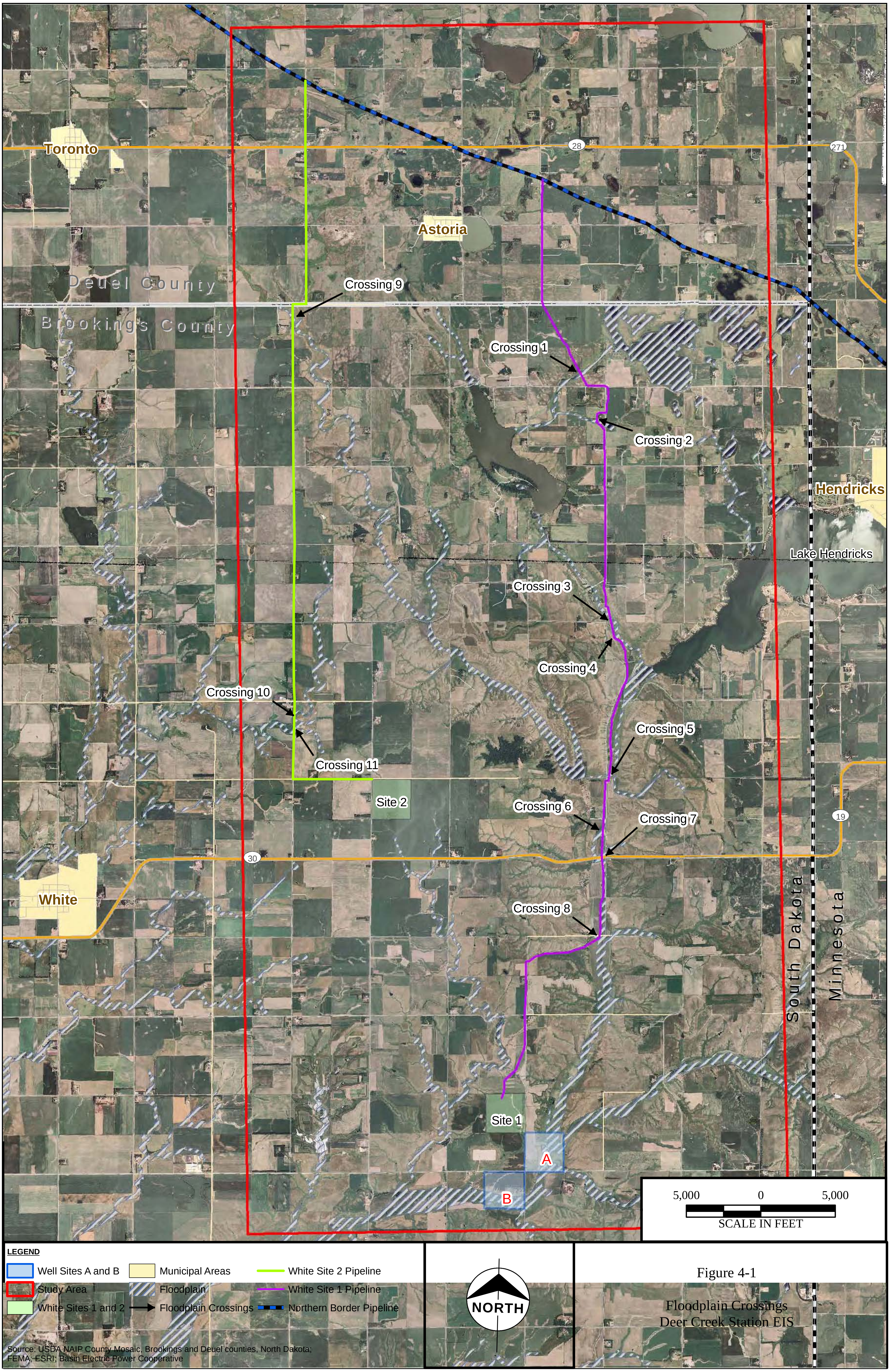


Figure 4-1

Floodplain Crossings
Deer Creek Station EIS

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Underground lines would be buried at depths adequate enough to avoid future erosion that could expose them. There would be no increased flooding from construction and operation of the White Site 1 Natural Gas Pipeline.

4.3.2.4.3 Groundwater

The White Site 1 Natural Gas Pipeline Route makes four crossings above Well Head Protection Areas. The approximate lengths (in feet) of each crossing, listed in order from north to south, and the approximate total length crossed, are presented in table 4-7. The crossings total 29,262 linear feet. Most of this distance (70 percent) is in the extensive valley from Lake Hendricks south to White Site 1 along 485th Avenue (figure 4-2). All crossings of the White Site 1 Natural Gas Pipeline Route are of the Zone B Well Head Protection Area. Necessary utilities such as a natural gas pipeline are allowed in Zone B areas.

Table 4-7: Gas Pipeline Well Head Protection Area Crossings in Approximate Linear Feet

Crossing Number	Approximate Linear Feet of Pipeline Crossing
White Site 1 Natural Gas Pipeline Route	
Crossing 1	1,343
Crossing 2	2,462
Crossing 3	4,827
Crossing 4	20,630
Total Linear Feet Crossed	**29,262**
White Site 2 Natural Gas Pipeline Route	
Crossing 5	410
Crossing 6	1,908
Crossing 7	576
Crossing 8	356
Crossing 9	4,200
Crossing 10	1,388
Total Linear Feet Crossed	**8,838**

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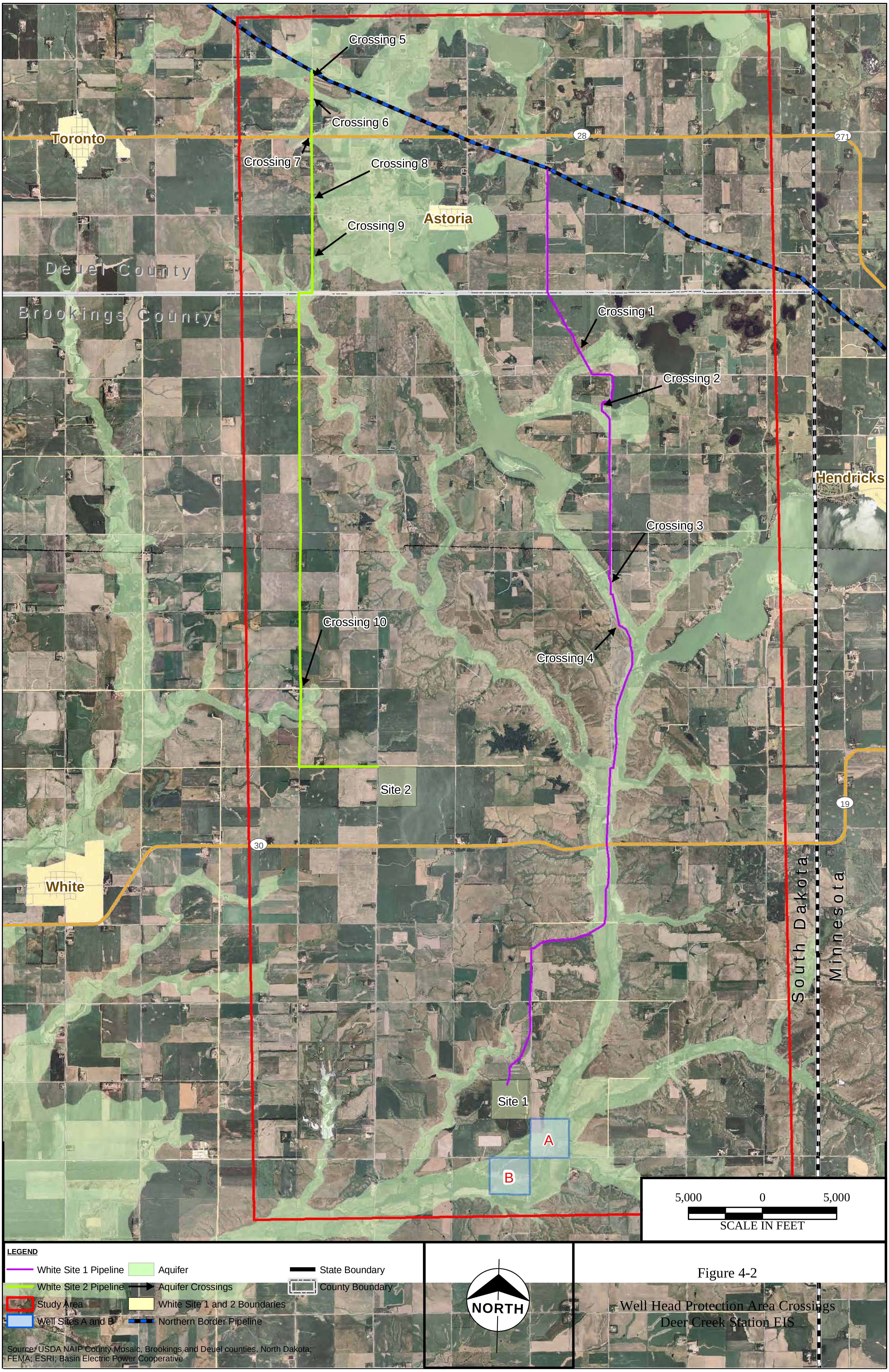

Figure 4-2

Well Head Protection Area Crossings
Deer Creek Station EIS

Other impacts to groundwater are possible if chemical spills occur during construction activities. Two previous chemical spills are known to have occurred along the White Site 1 Natural Gas Pipeline Route in Brookings County. In 2003, a spill of atrazine occurred at 485^{th} Avenue and 198^{th} Street; and in 1999, an acid cleaner spill occurred at 484^{th} Avenue and 197^{th} Street. According to the SDDENR (2009), both spills have been remediated and the cases closed. The equipment and materials used for pipeline construction would include very few chemicals of concern, and in small quantities. Fuel, oil, and hydraulic fluid would be the most common, and spills of these materials are easily remediated by on-site crews and clean-up materials. In order to mitigate the impact of possible chemical spills, spill prevention and control would be required. Spill plan measures would include spill containment materials at all construction sites and site crews trained in spill response and clean up.

4.3.2.5 White Site 2 Natural Gas Pipeline

4.3.2.5.1 Surface Water

Within the White Site 2 Natural Gas Pipeline Route, the pipeline would be trenched. If stream crossings involve wetlands of more than 0.5 acre, the pipeline would be directionally drilled to go under and avoid disturbing streams. BMPs would be used to minimize any sediment-laden runoff from entering any streams or roadside ditches. With appropriate use of BMPs, minimal impacts would be expected. Silt fence and sediment barriers would be placed along the route where disturbance takes place and vegetation would be established before any erosion control measures are removed (70 percent native perennial vegetative cover).

4.3.2.5.2 Floodplains

According to FEMA's 100-year flood zone maps, the White Site 2 Natural Gas Pipeline Route crosses or runs parallel to 100-year flood zones. The White Site 2 Natural Gas Pipeline Route makes four crossings of 100-year flood zones. The approximate lengths (in feet) of each crossing, listed in order from north to south, are presented in table 4-5. The White Site 2 Natural Gas Pipeline Route crosses a total of approximately 1,457 linear feet of 100-year flood zone areas.

The location of the White Site 2 Natural Gas Pipeline Route in relation to floodplains is indicated in figure 4-1. The pipeline would be buried and would not create permanent floodplain obstructions. Accordingly, natural and beneficial floodplain values would only be affected during a brief construction period and periodically during the operation period when repairs or maintenance activities are needed. The White Site 2 Natural Gas Pipeline Route follows roadways in order to minimize the potential for impacts to environmental resources. The crossings of floodplains are perpendicular to the streams, thus minimizing disturbance within the floodplain. In order for a pipeline to be routed to White Site 2, floodplain crossings are necessary (table 4-6). There are no pipeline routes that would completely avoid floodplains, given the locations that existing pipelines would need to be tapped, the alternative site locations, and the drainage patterns in the region. As a result of these considerations, there is no practicable alternative to construction of a natural gas pipeline in the floodplain crossings.

4.3.2.5.3 Groundwater

The White Site 2 Natural Gas Pipeline Route makes six crossings above the local Well Head Protection Area. The approximate lengths (in feet) of each crossing, listed in order from north to south, and the approximate total length crossed are listed in table 4-7. The location of the aquifer crossings are indicated in figure 4-2. The White Site 2 Natural Gas Pipeline Route overlies a total of approximately 8,838 feet of established Well Head Protection Area. The White Site 2 Natural Gas Pipeline Route makes two crossings over a Zone A Well Protection Area in the northwest region of the proposed Project area. This is the Astoria water well supply area. The crossings are approximately 447 and 358 feet, for a total of approximately 805 feet crossed. These crossings are on the very western edge of the Zone A area. Zone A areas are highly protected from potential contaminants; thus, extra measures of protection must be in place during construction and operation of the pipeline. The SDDENR recommends avoiding the crossing of established “A” Zones; however, the potential for a buried natural gas pipeline to cause groundwater impacts is minimal, and the pipeline has been routed to minimize impacts by choosing a route that only minimally affects two small areas on the edge of the Wellhead Protection area. Public utilities designed to prevent contamination from ground water are permitted in Zone A areas. The primary potential for impact would be from inadvertent chemical spills. Should White Site 2 be chosen and this pipeline route implemented, adherence to BMPs and SPCC plans would be required.

Other impacts to groundwater would be possible if spills of chemicals occur during construction activities. The equipment and materials used for pipeline construction would include very few chemicals of concern, and in small quantities. Fuel, oil, and hydraulic fluid spills have the potential to occur, however these materials are easily remediated by on-site crews and ready clean-up materials. In order to mitigate the impact of possible chemical spills, spill prevention and control would be required. Spill plan measures would include spill containment materials at all construction sites and site crews trained in spill response and clean up.

4.3.3 Cumulative Effects

Other past, present, and reasonably foreseeable future actions have affected water quality and floodplains in the Big Sioux and Lac Qui Parle watersheds. These include cropland erosion and agricultural nutrients from fertilizer and livestock waste. Of special concern for cumulative impacts is the Lake Hendricks watershed, along the White Site 1 Natural Gas Pipeline Route. Although pipeline construction would not by itself generate additional nutrient loading for the watershed, the addition of sediment would worsen the impaired status of the reservoir. Accordingly, adherence to construction BMPs would be required for pipeline construction. Appropriate use of BMPs during construction would adequately mitigate for potential erosion and sediment problems and ensure that this proposed Project does not cumulatively contribute to the impairment of Lake Hendricks. Construction of the White Wind Farm and the wind farm to the south of Deer Creek, together with past agricultural development, has the potential to cumulatively affect Deer Creek. In this watershed, use of appropriate BMPs during construction would mitigate for potential erosion and sediment problems and ensure that the proposed Project does not cumulatively contribute to erosion and sedimentation in this watershed.

Past road construction and culverts have cumulatively affected floodplains in the proposed Project area. Although natural and beneficial floodplain values have likely been impacted by cultivated cropland, no important levees, large dams, or stream channelization activities have been constructed in floodplains. However, agricultural improvements such as small stock watering dams have likely contributed to cumulative effects on floodplains. Additional impacts to floodplains from the proposed Project would be temporary. No permanent obstructions, other than the building in Water Well Supply Site B, would be placed in floodplains.

Water Well Supply Site B along Deer Creek is in an aquifer recharged by rainfall and Deer Creek; it is associated with the Big Sioux aquifer and is in an established Well Head Protection Area. However, the well is far enough away from other domestic wells and city water sources that it would not create a cone of influence that would impact other domestic or municipal water supplies. There are no other known efforts to withdraw water from the aquifer along Deer Creek in the vicinity of the proposed Project. Accordingly, the potential for adverse cumulative effects due to groundwater pumping is low. Monitoring wells would be installed to confirm if there are any groundwater pumping impacts and action taken to reduce or mitigate impacts if they occurred.

4.4 WETLANDS AND STREAMS

4.4.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no wetland or stream impacts associated with the No Action Alternative.

4.4.2 Proposed Project

Based on NWI information, the potential wetland impacts of the proposed Project at White Site 1 and White Site 2 are provided in Table 4-8 below. The acreage of wetlands shown on the NWI maps and wetlands actually delineated are not the same; however, the NWI acreage comparison provides a preliminary assessment of impacts between White Site 1 and White Site 2.

Table 4-8. Approximate Wetland Impacts Based in NWI Information

Project Location	White Site 1 (acres)	White Site 2 (acres)	No Action Alternative
Facility Layout Impacts	0.0	0.02	0.0
Substation Impacts	NA	0.21	0.0
Transmission Line Corridor Impacts*	0.0	1.70	0.0
Natural Gas Pipeline Corridor (75’ ROW)*	1.75	0.61	0.0
Water Well Supply Site/Water Pipeline (60’ ROW)*	0.0	0.05	0.0
Total Potential Impacts	**1.75**	**2.59**	**0.0**

* Temporary Impacts

Actual wetland delineation data is more accurate, and is provided for the Applicant’s preferred site and associated facilities. Wetlands and surface waters associated with the preferred site were delineated from October 29 through November 6, 2008, and from May 4 through 8, 2009, (EDAW 2009a, EDAW 2009b, EDAW 2009c; EDAW 2008). Based on the wetlands delineated for the preferred site and associated facilities, the NWI data understate the actual amount of wetlands present.

It is likely that many of the wetlands and surface waters found in the proposed Project area would be considered by USACE as jurisdictional under section 404 of the Clean Water Act. Isolated wetlands, those without a significant nexus to a water of the United States, may be considered non-jurisdictional by the USACE. However, impacts to isolated wetlands are still considered in this EIS. EO 11990 requires Federal agencies to avoid direct or indirect support of new construction in wetlands, whether jurisdictional or isolated, wherever there is a practicable alternative. EO 11990 would apply for the proposed Project. Impacts to wetlands would be considered significant if:

- The proposed Project would cause a permanent loss or degradation of wetlands or streams in violation of the terms and conditions of a Nationwide or Individual USACE section 404 permit

- The proposed Project would create long-term adverse unmitigated impacts associated with wetland modification or destruction
- Stream channel morphology or surface drainage patterns are altered to the extent that existing vegetation communities and habitats are degraded or productivity is reduced

The proposed Project is located in the watersheds of the Big Sioux and Lac Qui Parle rivers. The surface waters associated with the proposed Project include Deer Creek, multiple unnamed tributaries to Deer Creek and the Lac Qui Parle River, Oak Lake, Lake Hendricks, and Black Slough. The majority of wetlands found in the proposed Project area are associated with these water features. A jurisdictional wetland exhibits a predominance of hydrophytic vegetation, wetland hydrology, hydric soil, and connectivity to a water of the United States. A jurisdictional stream is defined as a waterway with an ordinary high water mark (OHWM). A few OHWM indicators include a bed and bank, a change in plant community, shelving, and water staining. A section 404 permit from the USACE is required prior to the start of any activity which would physically alter or discharge dredged or fill materials into a jurisdictional water of the United States, including wetlands. Wetlands could be temporarily impacted by placement of the pipeline by trench construction. However, larger wetlands would be directionally drilled underneath, resulting in no impacts. It is likely that all wetland impacts from pipeline construction would qualify for NWP 12 for utility lines. The wetlands in the pipeline corridor are generally in good condition, although impacted by agriculture and grazing. The majority of wetlands are classified as palustrine emergent and contain reed canarygrass, prairie cordgrass, yellow bristlegrass, and sedge species. Most reed canarygrass varieties are considered naturalized in the U.S. and are considered invasive.

Directional boring and open-cut trenching techniques would be employed where natural gas pipelines and water pipelines require a stream or wetland crossing. Directional boring would be the preferred construction method for large wetland complexes. Open-cut trenching methods may be used in other areas and in areas that are dry at the time of construction. Decisions on which method to use at each location would be made based on the conditions present at the time of construction, and would be made in consultation with the USFWS and USACE. During construction, buffers of 25 feet in width would be established around surface waters and wetlands to minimize sedimentation and runoff or spill of petroleum products. Wetlands that are temporarily impacted during construction would be restored to pre-construction conditions upon completion of construction activities. The final layout of the proposed Project would be designed to minimize impacts to identified wetlands and streams, but given the numerous wetlands in the proposed Project area, it is not possible to avoid all of them. It is not anticipated that impacts from the proposed Project would require habitat creation or restoration.

4.4.2.1 White Site 1 Alternative

Based on the NWI, no wetlands were associated with White Site 1; however, the actual delineation found wetlands at White Site 1 associated with an intermittent drainage. Four palustrine emergent (PEM) wetlands were delineated within this drainage along the eastern portion of White Site 1. The total area of these wetlands is approximately 3.24 acres, of which 0.04 acres would be impacted by proposed Project facilities. Deer Creek is a tributary to the Big Sioux River, which is classified by the USACE as a traditional navigable water. Because the four PEM wetlands are associated with an unnamed drainage which empties downstream into Deer Creek, these wetlands are likely jurisdictional waters. Vegetation is dominated by reed canarygrass, yellow bristlegrass, barnyardgrass, and prairie cordgrass. This is common wetland vegetation for the area, and the wetlands are not considered high quality. This PEM swale is located on the eastern half of the site and would be impacted by the construction of a permanent access road and site infrastructure. A narrow PEM swale, containing concentrated storm water, crosses the south end of the White Site 1 transmission corridor. Potential temporary impacts within this transmission line corridor are 0.22 acres. These wetlands are dominated by reed canarygrass, prairie cordgrass, yellow bristlegrass, and sedge species. This swale would be avoided by placement of transmission structures outside of the wetland. White Site 1 road improvements along 484th Avenue have the potential to cause temporary impacts to Deer Creek. A bridge over Deer Creek on 484th Avenue would be temporarily improved for use by heavy loads. The paving work on 484th Avenue north of 207th Street would be 20 feet from a wetland. No work in streams or wetlands would be required; however, BMPs would be used to avoid runoff impacts such as sedimentation. Gravel surfaces at approaches to intersections along the designated access routes would be considered for paving for a minimum distance of 300 feet to eliminate wash boarding and rutting that occur from deceleration, acceleration, and turning movements. The intersection segments would be paved to the extent necessary to provide the adequate tapers and radii for semi-trailer movements, which may require local ditch grading and location adjustment. Any additional grading outside of existing ditches would require biological surveys. If construction in wetlands is necessary, potential impacts may include soil compaction and erosion, hydrophytic vegetation removal and trampling, and the alteration of hydrologic regimes, including reduced floodwater absorption. These impacts would be avoided by minimizing the construction footprint, use of pads for heavy equipment, and restoration to pre-construction contours.

4.4.2.1.1 Water Well Supply Site B and Water Pipeline

The proposed groundwater well installation is located in a crop field to the west of 484th Avenue and would not directly impact wetland communities. The construction areas surrounding the wells would be restored to pre-existing conditions upon completion. Water Well Supply Site B is located 100 feet from a wetland complex associated with Deer Creek. A total of 26.60 acres of PEM wetlands are located on the Water Well Supply Site property; however, none of the wetlands would be directly impacted by the proposed Project. Wetland vegetation includes bog yellowcress, creeping foxtail, barnyardgrass, and reed canarygrass. This is a higher quality wetland than found on White Site 1. Consistently withdrawing water from a groundwater-sourced aquifer near surface water features has the potential for temporary and permanent impacts to the wetlands. However, testing indicated that this well is a productive source, thus minimizing the potential for a large cone of depression affecting nearby surface water features. During well installation and commissioning, monitoring wells adjacent to wetlands and waterways would be monitored to address any surface hydrology issues as a result of groundwater pumping. If issues were found to exist, an alternate water source would be investigated and developed. Drawdown of Deer Creek or adjacent wetlands as a result of groundwater pumping would be avoided.

Construction within the proposed water pipeline corridor that extends from the Water Well Supply Site B to White Site 1 would cross one PEM wetland, located southeast of White Site 1. The potential temporary impacts are 2.49 acres. In addition, the water pipeline would cross the PEM swale at White Site 1 described in section 4.4.2.1 above. Both wetland complexes would be temporarily impacted by the construction of this site infrastructure. Additionally, trench blocks would be installed adjacent to areas where the pipeline enters and exits a wetland to prevent hydrology and wetland morphology from changing as a result of pipeline installation. The pipeline area would be restored to pre-construction contours and the top 6 to 12 inches of the trench would be refilled with topsoil, in accordance with the stipulations of NWP 12. The pipeline has been routed to minimize construction beneath wetlands and other surface drainageways wherever feasible.

4.4.2.2 White Site 2 Alternative

According to NWI data, approximately 0.23 acres of permanent wetland impacts would occur due to facility construction and substation construction. An additional 1.7 acres of temporary impacts would occur within the White Site 2 Transmission Line corridor and 0.05 acres of temporary impacts would occur due to construction along the Rural Water Pipeline Extension corridor. Based on the ratio of delineated wetlands versus NWI wetlands noted for White Site 1, likely wetland impacts would be greater than indicated by NWI data. The layout of White Site 2 has been completed in conceptual design only. The PEM wetlands are mostly under cultivation, lack vegetation, and would be considered prairie potholes. However, the scattered nature of wetlands on the site makes it probable that some wetlands may be impacted if construction were to occur at this site. If construction in uncultivated wetlands cannot be avoided, potential impacts may include soil compaction and erosion, hydrophytic vegetation removal and trampling, and the alteration of hydrologic regimes, including reduced floodwater absorption. These impacts would be avoided by minimizing the construction footprint, use of pads for heavy equipment, and restoration to pre-construction contours.

4.4.2.3 White Site 1 Natural Gas Pipeline Route

According to NWI data, construction on the White Site 1 Natural Gas Pipeline Route would temporarily impact 1.75 acres of wetlands. However, more detailed field delineation indicates that approximately 6.60 acres of PEM, palustrine forested (PFO), and palustrine unconsolidated bottom (PUB) wetlands would be temporarily impacted within the White Site 1 Natural Gas Pipeline Route. Of this, 94 percent of the impacts would be to the PEM type. Major areas of wetland crossing are along two tributaries to Oak Lake, north and west of Lake Hendricks, and south of the 197th Street and 485th Avenue intersection (appendix B). These large wetlands would be considered high quality. Larger wetland complexes, such as those found south of 197th Street and west of 485th Avenue (NW ¼ Section 7, T112N R47W), would be directionally bored. This construction technique would minimize impacts to wetlands and waterways located within the White Site 1 Natural Gas Pipeline Route. Surface waters and wetlands without flowing or standing water at the time construction is initiated would be constructed using open-cut trenching. Additionally, trench blocks would be installed adjacent to areas where the pipeline enters and exits a wetland to prevent hydrology and wetland morphology from changing as a result of pipeline installation. At the wetland boundaries, the pipeline would be surrounded by clay or other low permeability material to stop the flow of any water that may have become channelized along the pipeline. During the routing process, the presence of wetlands and surface waters was considered in order to avoid these sensitive resources to the greatest extent feasible. Trenching would be done in the fall when it is the driest. Also, construction next to the roads should restrict any disturbance to the margins of wetlands crossed, and allows access and work from the raised roadbed.

4.4.2.4 White Site 2 Natural Gas Pipeline Route

NWI data indicates the presence of numerous small isolated PEM wetlands along stream channels within the White Site 2 Natural Gas Pipeline Route. According to NWI data, approximately 0.59 acres of PEM wetlands and 0.02 acres of PUB wetlands would be temporarily impacted within a 75-foot corridor within the White Site 2 Natural Gas Pipeline Route. Based on the ratio of delineated wetlands noted for White Site 1, it is likely that wetland impacts would be greater than indicated by NWI data. There are eight surface water drainages in the potential ROW. The northern portions of the pipeline corridor contain several prairie potholes that have not been cultivated; these would be considered high-quality wetlands. Wetlands were not delineated and actual acreage was not calculated. The pipeline would be installed via open-cut trenching in most cases, but directional boring would be used in the case of extensive wetlands. Open-cut construction would be used in areas without flowing or standing water at the time construction is initiated. Any wetlands or surface waters that are temporarily impacted during project construction would be restored to pre-construction condition. Construction would abide by the stipulations in NWP 12, Utility Line Activities.

4.4.3 Cumulative Effects

Other past, present, and reasonably foreseeable future activities in the proposed Project area with potential to affect wetlands in the Big Sioux ecoregion are ongoing farming operations, including past sod busting, the White Wind Farm to the north, the MinnDakota and Buffalo Ridge wind farms to the south, and a proposed wind farm to the west of the proposed Project site. The wind farms have been designed to minimize impacts to wetlands and streams. For example, the White Wind Farm has projected permanent wetland impacts of only 0.075 acres. In addition, there are fewer “prairie pothole” type wetlands in the Big Sioux ecoregion as compared to the Prairie Coteau ecoregion traversed by the gas pipeline route. Construction of the gas pipeline would result in temporary impacts to some wetland communities. The disturbed pipeline area would be restored upon completion of construction and no long-term loss or degradation of wetlands and surface waters would occur. Existing wetland and stream vegetation communities would not be degraded or productivity reduced. No unique or unusual wetland communities were identified on White Site 1 or 2 or on Water Well Supply Site B. The proposed Project is not expected to result in significant cumulative impacts to wetland or stream resources.

4.5 BIOLOGICAL RESOURCES

4.5.1 Vegetation

4.5.1.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no vegetation impacts associated with the No Action Alternative.

4.5.1.2 Proposed Project

Impacts to vegetation would be considered significant if:

- The proposed Project results in long-term loss of unique native vegetation communities, such as native prairie

- The proposed Project results in the long-term loss of riparian vegetation outside of the ROW corridor of the natural gas and water pipelines
- The proposed Project results in a permanent expansion of noxious weeds to a new location, covering more than one acre, or noxious weeds would expand to the degree that it would adversely affect the health and populations of native vegetation communities

Construction, operation, and maintenance of various proposed Project components including the plant site, groundwater well site, access roads, water pipeline, transmission corridor, and natural gas pipeline would result in impacts to both vegetation communities and noxious weeds. Construction of access roads and staging areas would result in both permanent and temporary loss of vegetation. Cleared areas through shelterbelts would be approximately 50 feet in width for pipeline or waterline construction and 100 feet in width for a road crossing. Construction activities generally result in vegetation removal, increased trampling of vegetation, erosion, soil compaction, and sedimentation. any of which could result in adverse effects to vegetation communities. Compacted soils can inhibit germination and root growth for native plant species. If soil compaction is severe on areas where there were formerly native plants, desired native plants may have difficulty becoming reestablished and could be replaced by new or weedy plant species. Ground disturbance may also result in propagation of noxious weeds, particularly in areas that have existing weed infestations.

Noxious weeds can be spread from unwashed construction equipment, vehicles transporting noxious weed-inoculated soil or plant materials into un-infested areas, or from transfer of topsoil inoculated with noxious weeds. Ground disturbance can also allow invasives to become established, as seeds may blow in from nearby infested areas. Noxious weeds typically are fast growing and can displace native species or inhibit reestablishment of native grasses, forbs, and shrubs. Mitigation measures to avoid the introduction or spread of noxious weeds would include requiring that construction equipment and vehicles are washed and free of soil and debris before entering the construction area. Additionally, a vegetation restoration plan and an integrated weed management plan would be implemented post-construction to mitigate impacts to vegetation communities in all portions of the proposed Project.

Alteration of existing drainages and drainage patterns pre- and post-construction may alter water availability for vegetation communities including wetlands. Species that are considered noxious and invasive weeds require less water and take advantage of disturbed bare ground. Proposed Project operations would require workers to travel to and within the general area, increasing the opportunity for the spread of noxious weeds.

White Site 1 Alternative

Construction of the plant would permanently impact approximately 40 acres of cultivated cropland at White Site 1. Temporary impacts to vegetation from construction may occur within the 100-acre site. Since the site is predominantly cultivated cropland (90 percent), impacts to native grassland and woodland communities are expected to be minor. Woodland and wetland habitats would be avoided to the greatest extent feasible during construction. A five-acre forested shelterbelt is located on the east edge of the proposed Project site. The 100-foot wide corridor containing temporary and permanent impacts resulting from the installation of the waterline and access road infrastructure at White Site 1 would impact less than one acre of the forested shelterbelt, equaling 20 percent of the shelterbelt. There is no native prairie on the site.

Within the 0.75 mile, 13.6-acre transmission corridor to the White substation, 40 percent of the vegetation is cultivated cropland, 55 percent is pastureland, and 5 percent is developed land. Temporary impacts would result from construction of any necessary access roads needed to build the transmission line. Permanent impacts to vegetation would be limited to the footprint of transmission structure, and the footprint of access roads, if needed. The transmission ROW (except for cropland) would be revegetated to pre-existing conditions once construction is complete. A noxious weed management plan would be implemented to minimize the spread of noxious weeds within the ROW and adjacent properties. White Site 1 road improvements along 484th Avenue would take place within the existing road ROW and would have only occasional and temporary impacts to mowed grass along the roadway from equipment usage.

Water Well Supply Site B and Water Pipeline

Approximately 40 percent of Water Well Supply Site B is cultivated cropland and 15 percent is used for pastureland. Wetlands and waterways are found throughout the southern half of the site. These areas will be avoided during the final site layout process. Construction of the well facilities would result in the permanent impact of an approximate 200-foot-by-200-foot vegetated area that is entirely cultivated cropland. Wetland communities and other vegetation communities outside of the 200-foot-by-200-foot well facilities may be temporarily or permanently impacted by groundwater pumping. Woodland and wetland habitats would be avoided during construction. Temporary impacts would occur along the approximate 1.25 mile water supply pipeline along 484th Avenue. The water supply pipeline would be located off the County Road ROW in private land that is predominantly pasture.

White Site 2 Alternative

Approximately 90 percent of White Site 2 is cultivated cropland with the remainder being woodland. Approximately 46 acres would be permanently impacted by construction. Temporary impacts may also occur within the 100-acre site. The facility footprint, including the future substation, would be sited to avoid impacts to the woodland on the site.

Within the transmission corridor, 90 percent of the vegetation is cultivated cropland. Temporary impacts would result from construction of any necessary access roads needed to build the transmission line. Permanent impacts to vegetation would be limited to the transmission structure footprints and maintenance access roads, if needed. The transmission ROW that is not to be returned to cultivation would be revegetated using a seed mix approved by NRCS and Western once construction is complete. A noxious weed management plan would be implemented to minimize the spread of noxious weeds within the ROW and adjacent properties. Final siting of the transmission line would seek to minimize placing structures through shelterbelts, in wetland habitats, and in native prairie habitat. Construction of the Rural Water Pipeline Extension would be within or adjacent to the road ROW and would have similar temporary vegetation impacts.

White Site 1 Natural Gas Pipeline Route

Impacts within the estimated 387-acre Natural Gas Pipeline Route construction ROW would be temporary. Approximately 184 acres of cultivated cropland (47 percent) and 130 acres of pastureland (34 percent) are the primary vegetation types that would be temporarily impacted during construction. Additional vegetation communities in the ROW that would be impacted include 12 acres of forested areas or shelterbelts (3 percent), 9 acres of native prairie communities (2 percent), 17 acres of mixed grassed prairie (native and non-native) (4 percent) , and 35 acres of wetlands (10 percent). Native prairie communities are located in isolated areas along the ROW, including near 204th Street and along 485th Avenue north of Lake Hendricks. These areas would be reseeded with native prairie seed. Two locations to be crossed by the White Site 1 Natural Gas Pipeline Route were determined to contain native prairie forb and native warm season grass communities. These include one hillside on the south side of 204th Avenue (NE ¼ Section 18, T111N, R47W) as well as one hillside on the east side of 485th Avenue, immediately northwest of Lake Hendricks (NW ¼ Section 29, T112N, R47W). Both locations of native prairie to be crossed are where the pipeline route leaves the road ROW and proceeds cross-country. Estimated distance of the pipeline through the native prairie at 204th Street would be 578 feet, and distance through the prairie near Lake Hendricks would be 2,042 feet. The natural gas pipeline ROW would be revegetated once construction is complete. Within the small areas of native prairie, the existing topsoil with its bank of native seed would be carefully salvaged and replaced in a timely manner, and augmented with native grass seed to minimize invasion of noxious or undesirable weed species. A noxious weed management plan would be implemented to minimize the spread of noxious weeds within the ROW and adjacent properties.

White Site 2 Natural Gas Pipeline Route

Within the White Site 2 Natural Gas Pipeline Route, 40 percent of the vegetation is cultivated cropland and 55 percent is pastureland. These combined areas would be temporarily impacted within the construction ROW. Forested shelterbelts are also present but only comprise five percent of the alternative gas construction ROW. The cleared area through shelterbelts would be a maximum of 75 feet in width. The White Site 2 Natural Gas Pipeline construction ROW outside of cultivated areas would be revegetated with grass once construction is complete. A noxious weed management plan would be implemented to minimize the spread of noxious weeds within the ROW and adjacent properties.

4.5.1.3 Cumulative Effects

Past, present, and reasonably foreseeable future actions that have affected vegetation in the area are the ongoing agricultural development and past sod busting in the Big Sioux and Prairie Coteau ecoregions, as well as the wind farm developments in the area, the White Wind Farm to the north, the MinnDakota and Buffalo Ridge wind farms to the south, and the proposed wind project to the west. The footprint of the proposed Project is small in comparison to these developments. The impacts to native prairie along the gas pipeline ROW would be temporary and would be restored. Therefore, the proposed Project would not result in the long-term loss of unique natural communities. Riparian vegetation would be preserved during construction and operation of the natural gas pipeline. The potential for noxious weed expansion would be reduced by revegetation with native species seed mixes. As a result, the individual and cumulative impacts of the proposed Project on vegetation would not be significant.

4.5.2 Wildlife

4.5.2.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no wildlife impacts associated with the No Action Alternative.

4.5.2.2 Proposed Project

The mix of wetland, riparian, prairie, and woodland areas, along with agricultural land uses, provides a wide range of habitats for the numerous wildlife species that occur within the proposed Project area. The wildlife species discussed within this section are those not listed under a State or Federal designation for protection. Impacts to wildlife resources would be considered significant if the proposed Project would have a negative impact on the biological viability of a local, regional, or national population of wildlife species. Some general impacts to wildlife resulting from the construction and operation of a generation facility and associated infrastructure are discussed below. Impacts to wildlife can be direct, indirect, permanent or temporary and may be separated, when necessary, into construction and operation impacts.

Terrestrial habitats include tall grass prairie, mixed-grass prairie, cool-seasonal and invasive grass areas, cultivated cropland, pastureland, woodland areas, and wetlands. The proposed Project area is located in areas of mostly open, rolling hills with limited forest cover in the form of shelterbelts; therefore, minimal fragmentation of woodland shelterbelt areas would result. The power plant, water well site, and transmission line cross mostly cultivated cropland. Wildlife species would temporarily avoid areas during construction, which would result in the temporary or permanent alteration of movement patterns, depending on the species and project feature.

Construction activities that remove vegetation and disturb soil could cause the mortality of small, less-mobile, ground-dwelling wildlife species such as the thirteen-lined ground squirrel, prairie vole, eastern cottontail, and amphibians and reptiles. These species would also be temporarily displaced during construction activities, but would likely return upon completion of construction and restoration of disturbed habitats. Other mobile species, such as ring-necked pheasant, some migratory bird species, raccoon, coyote, and whitetail deer may leave and avoid the construction areas, but would be expected to return within a year with the restoration of suitable habitat to areas such as the natural gas pipelines, water pipelines, and transmission ROWs. Some wildlife would likely avoid the permanently disturbed areas, depending on the nature of the facility and the amount of human activity in the area. Due to the abundance and diversity of available habitat for wildlife in the area, construction and operation of the proposed Project would not be expected to have permanent impacts on local or regional species populations.

Open cut trenching to install the pipelines may be used at streams and wetland areas that do not have suitable habitat for listed species. Trenching would produce temporary impacts to aquatic life. The areas within the immediate drainage of the streams would only be subjected to minimal temporary impacts during construction and there would be no permanent impacts. As a result, wildlife inhabiting the aquatic and adjacent habitats would be minimally impacted during construction and operation. Directional drilling would be utilized in wetland areas whose areal extent is great or where other physical constraints exist to placement of the pipeline by trenching methods. Riparian and wetland areas as well as shelterbelts would be preserved whenever possible because they provide crucial nesting and roosting habitat for avian species, as well as cover and forage for big game, upland game birds, and a variety of other wildlife species in the area. If construction occurs between March 15 and July 15, avian nesting surveys would be conducted by a qualified specialist in order to avoid bird nests. If special status or migratory species were found nesting, USFWS would be consulted to identify measures, such as avoidance buffers, to minimize impacts and avoid the take of breeding birds.

Waterfowl nesting areas would be subjected to temporary impacts during pipeline installation in wetland areas as well as through activities near streams and associated riparian areas. There are areas of suitable nesting habitat for migratory and resident raptors within or in proximity to the proposed Project area. In general, disturbance of birds would be greatest during the spring-to-early summer breeding season as well as spring and fall migrations. Most facility construction would occur during the fall to take advantage of dry conditions and to avoid impacts to nesting species; however, if construction were to occur during the avian breeding season, nesting bird surveys would be conducted prior to any ground-disturbing activities. The USFWS would be consulted to identify measures to minimize impacts and avoid, minimize, or mitigate disturbance or take of nesting avian species at locations with suitable habitat within the proposed Project area. The majority of the avian species found within the proposed Project area are protected under the MBTA.

Sedimentation in aquatic ecosystems can adversely impact feeding, resting, and breeding habitats. For pipeline construction, directional boring would be used beneath extensive wetland complexes. Open-cut trenching methods may be used in other areas and in areas that are dry at the time of construction. Decisions about which method to use at each location would be based on site conditions at the time of construction. In anticipation of trenching, the appropriate permits under section 404 would be acquired, such as NWP 12. Streams that are temporarily impacted during construction would be restored to pre-construction contours upon completion of construction activities. These techniques would minimize or avoid impacts to environmentally sensitive areas. Impacts to the existing invertebrate, fish, amphibian, and reptile species would be temporary and are anticipated to be negligible as a direct result of planned construction or operation of the proposed Project. Potential temporary or permanent impacts to the aquatic communities may occur as a result of unforeseen environmental events (e.g., flooding, tornadoes, or excessive snowmelts). Unforeseen events could exceed the effective capabilities of recommended BMPs, or equipment could malfunction and fail during the construction process. During construction that is near surface waters and wetlands but does not involve trenching or boring, 25-foot buffers would be established around surface waters and wetlands to minimize potential sedimentation and runoff and protect against spill of petroleum products. Buffers would be marked by the installation of silt fence. Areas of permanent impact, including paved roads, graveled parking lots, and other operational areas, would enable increased precipitation runoff that may carry higher concentrations of total dissolved solids and hydrocarbons. Areas within the proposed Project site would be engineered to reduce indirect effects from storm water runoff to aquatic habitats near the site. The operating area of the proposed Project would be graded so that stormwater would be directed to drainage ditches and swales and then to an on-site stormwater detention pond. Operation of the proposed Project may result in temporary impacts to surface water, groundwater, or wetlands through unforeseen equipment malfunctions leading to amplification in the impacts of runoff. These potential impacts would be minimized through proper design of facilities, use of BMPs, and good housekeeping practices in chemical usage.

White Site 1 Alternative

Wildlife species such as small birds and mammals that may forage in the agricultural portion of this area would relocate to other nearby agriculture fields during construction and operation. However, impacts to these species would be minimal as there is abundant similar habitat nearby. Plant construction may result in the loss of some areas that are not currently cultivated cropland. These areas are of greater value to wildlife as habitat and include a forested shelterbelt that comprises five percent of the acreage of White Site 1. This is located on the east side of the proposed Project site. The temporary and permanent impacts resulting from the installation of the waterline and access road infrastructure at White Site 1 (about a 100-foot wide corridor) would impact less than one acre of the forested shelterbelt. Avian species that may use the woodland areas for nesting, foraging, or stopover habitat as well as ground-dwelling mammals would be minimally impacted as a result of this portion of the proposed Project construction. Of the 3.2 acres of PEM wetlands on White Site 1, a portion would be affected by access road and water pipeline construction; impacts would be less than the one-half acre NWP thresholds for road crossings or utility line crossings. The PEM swale is located on the eastern half of the site and would be impacted by the construction of a permanent access road and site infrastructure. The PEM swale was previously periodically maintained by mowing for agricultural purposes and provides very little wildlife habitat.

One inactive raptor nest was located in 2009 in the southeast corner of White Site 1, on the southern end of the forested shelterbelt, outside of the area to be impacted by construction. One great horned owl nest was located in 2009 approximately 0.35 miles east of White Site 1 in a narrow forested shelterbelt surrounded by an abandoned farmstead. SDGFP would be consulted if any active raptor nests were discovered within 0.25 miles of any of the proposed Project facilities during construction. Because only two nests may potentially be impacted, the biological viability of raptors or owls would not be affected by activities at White Site 1.

Impacts to wildlife other than birds during construction on White Site 1 are also expected to be minimal, because the cropland, pastureland, and shelterbelt habitats within disturbance areas crossed are common; no long-term impacts to local, State, or national populations are likely. Operation of the generation facility may cause some species of wildlife to avoid the facility site due to increased human activity and noise associated with the facility. All of the species disturbed are likely to be common and would relocate in abundant suitable habitat elsewhere.

Water Well Supply Site B and Water Pipeline

Construction on Water Well Supply Site B would permanently impact a portion of the cultivated cropland in the area necessary for the footprint of the pumping structure and construction and maintenance of the access road to the location. An estimated 200-foot-by-200-foot area would be required for construction and operation. Wildlife habitat in these locations is minimal due to the current land use as cultivated cropland and small total acreage required. Construction of the water supply line to the generation facility is anticipated to parallel the county road along 484th Avenue. The pipeline ROW would predominantly be across pastureland that provides marginal wildlife habitat. The construction of the water supply line would cause temporary disturbance to soil and vegetation and displacement of wildlife species using this area. Temporary impacts would occur within the well construction area; these impacts would all be within a cultivated field.

Water Well Supply Site B is located near a wetland complex associated with Deer Creek, as well as Deer Creek itself. Consistently withdrawing water from a groundwater-sourced aquifer near surface water features has the potential for temporary and permanent impacts to the hydrological dynamics of the immediate area and therefore the aquatic habitat, aquatic species, ecologically connected terrestrial habitat, and terrestrial wildlife that use these habitats throughout the year. However, testing indicated that this well is a productive source, thus minimizing the potential for a large cone of depression affecting nearby surface water features (Banner Associates 2009). As a precaution, temporary monitoring wells would be located between the two production wells and Deer Creek. If the cone of influence does not extend to these monitoring wells, it would be assumed that there is no impact to Deer Creek. If impacts were noted at the monitoring wells, Basin Electric would develop a mitigation plan for any hydrologic and biological impacts to Deer Creek.

White Site 2 Alternative

Approximately 90 percent of the land use within the White Site 2 area is cultivated cropland. Additionally, an estimated 90 percent of the land use within the White Site 2 Transmission Corridor is cultivated cropland. About 10 percent of the land within White Site 2 is a forested shelterbelt, which would be avoided by power plant and substation construction. Wildlife habitats found at White Site 2 include those described for White Site 1 in regard to the cultivated cropland areas. The total area impacted and potential impacts for White Site 2 are similar to the cultivated cropland areas for White Site 1. However, White Site 2 would have a larger total percentage of permanent surface changes and subsequent potential surface runoff due to the additional construction of the necessary substation. Potential temporary impacts to wildlife and wildlife habitat are expected to be similar to those discussed above for White Site 1. However, the addition of the substation would result in six acres of additional permanent impacts. The construction of the Rural Water Pipeline Extension planned for White Site 2 would require the temporary removal of approximately 0.05 acres (according to analysis of NWI data) of wetland vegetation and, depending on the final routing, permanent removal of less than one acre of woody areas along the pipeline corridor. These activities would cause temporary disturbance or displacement of wildlife species during construction as well as permanent displacement of some species during operation. Some mortality of small, ground-dwelling animals may occur during construction, but impacts are not expected to affect local or regional species populations. As a result, wildlife inhabiting the aquatic, semi-aquatic, and wetland habitats would be minimally impacted during construction and operation.

White Site 1 and White Site 2 Transmission Corridor

The proposed Project area occurs at the border between the Central and Mississippi flyways; some of the waterfowl species that may occur in the proposed Project area are listed in appendix C. The presence of overhead transmission lines may increase the collision and electrocution risks for avian species and bats, especially near wetlands and riparian areas (APLIC 2006). The proposed Project would be built following USFWS and Avian Power Line Interaction Committee (APLIC) guidelines to minimize bird risks. The transmission line, including structures, would be placed outside of wetland and riparian habitat to minimize habitat loss and the displacement of amphibians, reptiles, small mammal, and avian species that may use the transmission ROW.

Construction and operation of the 0.75-mile long transmission line for White Site 1 would be primarily within cultivated cropland (40 percent), pastureland (55 percent), and developed land (five percent). The 0.50-mile long transmission line for White Site 2 would cross cultivated cropland for its entire length. Habitat loss to species in the area would be minimal due to the current land uses. The potential for localized, permanent habitat loss and possibly the direct mortality of less mobile ground-dwelling species within the corridor exist in locations where transmission structures are located in areas not used for cultivated cropland. Foraging and resting areas in pastureland would be temporarily altered by access roads and human disturbance during construction and operation. The area affected would be little more than the width of a vehicle track and would most likely occur in the fall, during non-nesting and dry weather. Permanent impacts from transmission lines associated with the proposed Project are not expected to be significant to local, regional, or national species populations.

White Site 1 Natural Gas Pipeline Route

Approximately 35,800 linear feet (6.8 miles) of the White Site 1 Natural Gas Pipeline would be constructed parallel to existing local roadways, and 33,500 linear feet (6.4 miles) would be constructed cross-country. Although construction is adjacent to existing road ROW, the pipeline would require new easements immediately adjacent to the road easements. Because the pipeline is adjacent to habitat that has already been fragmented by roadways, the impacts to wildlife habitat would be less than for those portions routed cross-country. Native vegetation has been previously disturbed along most of the proposed ROW length through cultivation, introduction of livestock, and encroachment of non-native grass species. Two locations to be crossed by the White Site 1 Natural Gas Pipeline Route were determined to contain native prairie forb and native warm season grass communities. These include one hillside on the south side of 204th Avenue (NE ¼ Section 18, T111N, R47W) as well as one hillside on the east side of 485th Avenue, immediately northwest of Lake Hendricks (NW ¼ Section 29, T112N, R47W). Both locations of native prairie to be crossed are where the pipeline route leaves the road ROW and proceeds cross-country. Impacts in these areas are expected to be temporary, with direct impacts to small mammals and avian species including loss of habitat and noise disturbance during construction. Mammals, amphibians, reptiles, and bird species may also experience temporary impacts as a result of trenching during construction. Trenching activities may result in localized permanent impacts to individual small, ground-dwelling wildlife species that may occur in the area. Following construction activities, the area would be revegetated following an approved protocol and wildlife would move back into the area.

One inactive raptor nest of an unknown species was located in 2009 approximately 0.47 mile southwest of the proposed construction ROW in a shelterbelt just east of 484th Avenue and north of 197th Street (EDAW 2009b). If construction were to occur during the avian breeding season, loss of habitat and human disturbance could result in temporary or permanent impacts to individuals and populations of avian species. Most facility construction would occur during the fall to avoid impacts to nesting species; however, if construction were to occur during the avian breeding season, pre-construction surveys would be conducted prior to any ground-disturbing activities. Basin Electric, Western, and RUS would consult with the USFWS prior to construction during this time period to determine measures to avoid impacts to migratory bird species. Some segments of the pipeline would be constructed using directional boring, also resulting in minimized impacts to associated common wildlife and aquatic habitat. Aquatic, wetland,

and terrestrial habitats that would be open-cut trenched would be restored to pre-construction conditions to mitigate long-term impacts to habitats and wildlife species found in these areas. Because only one nest would be involved, the biological viability of raptors protected under the MBTA would not be affected by activities along the White Site 1 Natural Gas Pipeline Route.

Impacts to wildlife other than birds during construction along the White Site 1 Natural Gas Pipeline Route are also expected to be minimal, because the cropland, pastureland, and shelterbelt habitats crossed are common, with no long-term impacts to local, State, or national populations. The native prairie habitat crossed in two locations would only be temporarily impacted. Species utilizing this habitat would likely temporarily relocate and return as restoration progresses. As a result of these considerations, the construction and operation of the White Site 1 Natural Gas Pipeline would not likely have permanent significant impacts on the terrestrial or aquatic wildlife populations along the proposed route.

White Site 2 Natural Gas Pipeline

Habitats found within the alternate gas pipeline corridor are similar to those found within the proposed corridor; therefore, construction and operation of the White Site 2 Natural Gas Pipeline, although shorter than the proposed pipeline, is expected to have similar impacts on wildlife populations.

4.5.2.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions that have affected wildlife populations in the area include the extensive agricultural development of the past, and the more recent wind farm developments. More recent developments such as the wind farms have sought to minimize impacts to wetlands, native prairie, and woodland habitats. Most of the permanent impacts of the proposed Project would take place on existing agricultural lands with minimal potential for adverse cumulative impacts to wildlife. Because of the avoidance measures and construction methods that have been incorporated into the proposed Project, only temporary impacts are expected to wetlands or native prairie. Minor impacts to shelterbelts would occur where they are adjacent to existing ROWs. Construction at either White Site 1 or White Site 2 would not affect the biological viability of wildlife species. Construction and operation of White Site 2 would result in fewer impacts to wildlife and fisheries resources compared to White Site 1. However, regardless of the site chosen, the proposed Project would not contribute to significant adverse cumulative wildlife impacts.

4.5.3 Special Status Species

Species that have special State or Federal status are discussed in this section, including species listed as endangered or threatened under the ESA, species that are candidates for Federal listing, species listed as endangered or threatened on State endangered species lists, and species protected by the BGEPA.

4.5.3.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no special status species impacts associated with the No Action Alternative.

4.5.3.2 Proposed Project

Impacts to species with State or Federal status or their designated critical habitat would be considered significant if:

- The proposed Project would cause or be likely to cause an adverse affect on a federally-listed threatened or endangered species, designated critical habitat, or candidate species for Federal-listing
- The proposed Project would affect the biological viability of a State-listed threatened or endangered species
- The proposed Project would affect the biological viability of a species protected under the MBTA or the BGEPA.

4.5.3.2.1 Federal Species

For compliance with section 7 of the ESA, a separate Biological Assessment is being developed. The following is a summary of impacts to federally listed species, as well as impacts to the bald eagle, which is protected under other laws.

According to the USFWS letter of April 7, 2009, species with Federal status that have the potential to occur in the proposed Project area include the federally-endangered American burying beetle and Topeka shiner, the federally-threatened western prairie fringed orchid; and the Dakota skipper, a candidate for Federal listing. USFWS also stated that the proposed Project is “east of the migration corridor where 95 percent of whooping cranes have been documented; thus, the likelihood of occurrence at the proposed Project site is very low. Only rarely have individuals been pushed off-course by weather events and occurred in habitats near, or even further east than, the proposed Project site." The USFWS county list also does not list the whooping crane as occurring in Brookings or Deuel counties (USFWS 2009).

The Topeka shiner has been documented in Deer Creek and associated tributaries that are found in the Project area. The American burying beetle and western prairie fringed orchid have not been known to occur in eastern South Dakota in recent decades. However, the western prairie fringed orchid is known to occur in southwest Minnesota (section 3.4.4). Representatives of Basin Electric, USACE, SDGFP, USFWS, and Western met on May 5, 2009, to discuss biological resource issues and permitting for the proposed Project. It was determined through this informal consultation that suitable habitat for the American burying beetle does not occur in the proposed Project area and that surveys for the species are not required (Schriner 2009). It was determined that federally listed species with the potential to be impacted by the construction and operation of the proposed Project are the Topeka shiner and western prairie fringed orchid, and also that the candidate species Dakota skipper has the potential to be impacted.

Topeka shiner habitat surveys were completed in September 2009. The only streams determined to have potential habitat were three locations along Deer Creek and one tributary. However, no project facilities are proposed that would involve pipeline construction through or under Deer Creek. Standard BMPs would prevent any substantive impacts to the waterways and there would be no significant impacts as a result of construction and operation. Water Well Supply Site B, which would provide process water for the proposed Project, is located in the floodplain to the north of Deer Creek. A test well has been installed and pump test results suggest that there would be no impact to Deer Creek at the water withdrawal levels to be used by the proposed Project. However, monitoring wells would be placed between the water well and Deer Creek to monitor the cone of influence for groundwater withdrawal and ensure that no impacts to water levels in Deer Creek occur. If it is determined that hydrological impacts to Deer Creek are occurring, additional consultation would be initiated with USFWS.

Habitat evaluations of the vegetation communities within the Project area were completed in July 2009 to determine if suitable habitat was present to support populations of the western prairie fringed orchid. No suitable habitat capable of supporting populations of the western prairie fringed orchid was located within the proposed Project area (Larson 2009). Construction and operational activities would result in no temporary or permanent impacts to this species on a local or regional level. The proposed Project would have no effect on the western prairie fringed orchid.

Habitat evaluations within the proposed Project area were conducted in June 2009 to determine if suitable habitat was present for the Dakota skipper. Three locations in the vicinity of the proposed

Project were determined to contain prairie forb and native warm season grass communities capable of supporting Dakota skipper populations. One location was to the southeast of White Site 1 near 207th Street (SW ¼ Section 30, T111N, R47W) and in an area that would not be impacted by construction or operation of the Project. The remaining two locations are along the White Site 1 Natural Gas Pipeline Route and include a north- and east-facing hillside on the south side of 204th Street (NE ¼ Section 18, T111N, R47W) as well as a west-, south-, and east-facing hill on the east side of 485th Avenue, immediately northwest of Lake Hendricks (NW ¼ Section 29, T112N, R47W). The White Site 1 Natural Gas Pipeline Route traverses 578 feet of native prairie at 204th Street and 2,042 feet of native prairie at 485th Avenue. Presence/absence surveys for Dakota skippers were completed during the short flight period of this species during summer 2009. Dakota skippers were found at the location southeast of White Site 1 but not at either location along the pipeline corridor (Skadsen 2009). Dakota skipper habitat is uncommon in the general area of the proposed Project and natural gas pipeline corridors.

Construction and operation of the power plant, transmission corridor, or proposed water well supply location would not directly impact known Dakota skipper populations. Although the Dakota skipper was not observed within the White Site 1 Natural Gas Pipeline Route, suitable habitat for this species exists in two locations along the ROW. Therefore, it is possible that the Dakota skipper and its habitat could be impacted during project construction. The current proposed Project layout would result in temporary impacts to suitable habitat within the pipeline ROW. These impacts would be minimized through the implementation of BMPs during and after construction, the restoration of native prairie communities within the ROW, and the implementation of a noxious weed management plan. To ensure that impacts are avoided, pipeline construction would not take place in the two locations of Dakota skipper suitable habitat during the growth and blooming period for the nectar source of the adult butterfly (May-July), which includes the summer breeding period of the butterfly.

The bald eagle is federally protected under the MBTA and BGEPA. One bald eagle was observed in October 2008 near the Lac Qui Parle River, which feeds into Lake Hendricks. Although bald eagles are found in the general area, no bald eagle nests have been identified near proposed Project facilities (EDAW 2009a). Therefore, no adverse impacts to the bald eagle would be expected. Other migratory birds in the area would be temporarily affected during construction, but because large-scale habitat changes are not part of the proposed Project, minimal habitat impacts are anticipated. In addition, construction of gas pipelines would be scheduled during the late summer and fall, after nesting season.

4.5.3.2.2 State-listed Species

State-listed species with the potential to occur in the Project area include the northern redbelly dace, banded killifish, blacknose shiner, sturgeon chub, osprey, eastern hognose snake, lined snake, and northern red-bellied snake. The eastern hognose snake and lined snake could potentially occur at White Site 1 around the shelterbelts on the eastern side of the site and could feed in the wetland and surface waters of the proposed Project site. Construction would be designed to avoid these areas. If present on site, some individuals could be temporarily affected if construction activities disturbed these areas, but they would more likely relocate to nearby areas during the construction period. Permanent impacts to the state-listed northern redbelly dace, banded killifish, blacknose shiner, sturgeon chub, and northern redbellied snake would be avoided by use of BMPs where construction would take place in the Deer Creek watershed.

4.5.3.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions with the potential to cumulatively affect aquatic species include agricultural development along with soil and nutrient enrichment of the watersheds, county road construction, especially involving bridges and culverts, and wind farm construction, which involves access road culverts. Because no permanent stream or wetland impacts are anticipated due to the use of BMPs and directional drilling where necessary, the Deer Creek Station Project, when combined with other actions also affecting aquatic resources, would not cumulatively contribute to impacts on the Topeka shiner or other aquatic species in the area.

Past, present, and reasonably foreseeable future actions with the potential to affect terrestrial species like the western prairie fringed orchid and Dakota skipper include agricultural development of prairie habitats, county road maintenance, and wind farm development. These past actions have tended to fragment prairie habitat and are responsible for the remaining habitat “islands” in the area. Impacts to native prairie and prairie forb habitats would be mitigated by the Deer Creek Station Project and associated facilities, so the proposed Project would not cumulatively contribute to impacts on terrestrial species.

Bird species protected under the MBTA or BGEPA would be minimally affected by construction and operation activities of the proposed Project. Because no major habitat changes would be caused by the project, the project would not contribute to significant adverse cumulative effects on any bird species.

4.6 SOCIOECONOMIC RESOURCES

4.6.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no socioeconomic impacts associated with the No Action Alternative.

4.6.2 Proposed Project

Under the proposed Project, socio-economic impacts would be considered significant if:

- In-migration of the proposed Project work force would induce population growth that would strain government and community facilities and services
- In-migration of the proposed Project work force would result in insufficient existing housing within the study area for both workers and their families
- In-migration of the proposed Project work force would change the economic base of the study area

Potential socioeconomic impacts could come from population growth associated with the construction of the power generation station. This growth could affect the local economy, the regional housing supply, and local government services. It is estimated that the proposed Project would require 360 workers at the peak of construction and 30 permanent employees once the plant has been completed. Since it is not uncommon for workers in the region to commute an hour or more to work, it can generally be assumed that workers would be spread out over the region (First District Association of Local Governments 2009).

There would be short-term impacts on local housing, but they would be minimal. Of the estimated 360 workers needed during the construction phase, 252 are expected to come from out-of-state based on an area labor study. While these workers have the potential to strain the available affordable rental housing in the region, the First District Association of Local Governments (2009) found that there are 740 affordable rental units, units with rent below $500 a month, within the counties from which workers in Brookings County typically commute. In addition to affordable rental housing, there are also 500 available camper sites within the region. Many workers may decide to use these camper sites as a housing option. The 30 permanent employees needed in the operation and maintenance of the plant once it is completed would also find sufficient available housing and their presence would have no long-term housing impacts on the region.

Since it is possible that about 252 construction workers would be coming from outside the immediate area, it is likely that there will be short-term positive economic impacts. Lodging, food, retail and other services would likely benefit from the construction of the proposed Project. In addition to services directly related to the workers, services related to the construction of the proposed Project would also benefit. Local material suppliers, mechanics, and business support services would benefit the most from construction.

Local governments could also have both short- and long- term benefits from tax revenue collected during construction and operation. Taxes collected from retail sales and property taxes are especially important since South Dakota has no corporate income tax, personal income tax, personal property tax, business inventory tax, or inheritance tax. The retail and lodging needs of the construction workers would produce a temporary increase in taxes collected. Once the proposed Project is completed, property taxes collected from the plant would benefit local and State governments. Property owners would also benefit from payments for ROW easements associated with the proposed Project natural gas pipelines and transmission lines.

Since construction workers would only be on site from July 2010 to August 2012, it is unlikely that the proposed Project would have any long-term negative impacts on local government services. During construction, government resources such as educational resources, law enforcement, fire protection, and health services would be needed by the workers and their families.

During construction, there would be no significant impact to the education resources within the proposed Project area. At the peak of construction, with 360 workers on site, it has been estimated that there would be 72 worker-related students based on the national average of 0.2 children per household. The three school districts in the proposed Project area can absorb 277 new students before they reach peak enrollment. The educational resources would be sufficient to meet the needs of the workers and their families during construction, and would be sufficient to meet the needs of the 30 permanent employees once the plant is completed.

At the present time, Brookings County has 14 law enforcement officers and 17 retired volunteers that make up the senior patrol. Fire protection in the study area is primarily provided by volunteer departments with 131 volunteer fire fighters. The City of Brookings has a paid fire chief, assistant, and secretary. Surveys collected from both law enforcement and fire services in the study area for the First

District report indicated that the law enforcement and fire protection services in the proposed Project area would be adequate to handle the temporary influx of workers.

There are five major health providers in the proposed Project area. These are Brookings Avera Clinic, Brookings Sanford Clinic, Brookings Health System, White Family Clinic, and Elkton/Avera Clinic. In addition to these, there are a number of clinics and other health services in the region to handle health needs. Ambulance and emergency services are provided by the cities of Brookings, Elkton, White, and Aurora. Surveys collected from health officials in the study area for the First District report indicated that the health services in the proposed Project area would be adequate to handle the temporary influx on workers.

4.6.3 Cumulative Effects

The development of wind farms, together with the development of Deer Creek Station, would yield additional employment opportunities in the local project vicinity. These employment opportunities would affect housing demand and would contribute positively to the economy of the area. For every 20 wind turbines, about five construction jobs and three permanent operation and maintenance jobs are created. These low numbers suggest that the cumulative effects of the wind farms and the Deer Creek Station Project would not strain local government services and would generally be a positive impact from a socioeconomic standpoint.

4.7 ENVIRONMENTAL JUSTICE

Environmental justice impacts would be considered significant if the proposed Project had a disproportionate impact on minority or low-income residents. Minority or low-income communities are not present in the proposed Project area, and under the No Action Alternative as well as the proposed Project, no minority or low income communities would be disproportionately affected.

4.8 LAND USE

4.8.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no land use impacts associated with the No Action Alternative.

4.8.2 Proposed Project

Impacts to land use under the action alternatives would be considered significant if:

- The proposed Project would conflict with applicable land use plans or regulations that were not resolved with the regulatory agency
- The proposed Project would conflict with existing land uses in the study area to the point where other land uses could not continue
- The loss of agricultural farmland would affect the overall agricultural production in the county

The proposed Project would involve the fencing of 100 acres of land currently used for crop production for the utility facilities. Of this, 40 acres would contain long-term facilities, and the remainder would be maintained as part of the plant site and would not be used for crop production. Similarly, 100 acres of agricultural land would be fenced for utility facilities at White Site 2. Of this, 46 acres would contain long-term facilities, and the remainder of the fenced portion would be maintained as part of the plant site. Coordination with Brookings County and Deuel County is ongoing to ensure that the proposed Project does not conflict with land use plans identified in the Comprehensive Land Use Plan for Brookings County (BCPC 2000) or the Comprehensive Land Use Plan for Deuel County (DCPC 2004a). The proposed Project would be permitted, constructed, and operated in accordance with all applicable land use regulations, including the Brookings County Zoning Regulation and the Deuel County Zoning Ordinance.

Land use impacts would include both permanent land use changes as well as temporary land use disturbances during construction. The primary land use impact would be the conversion of agricultural land to utility-related uses. Because of the large amount of acreage of agricultural land in the area, these impacts are not expected to be significant. In addition to agricultural land, there are also several existing utility-related land uses in and around the study area, including a substation, transmission lines and several existing and planned wind farms. Construction of the proposed Project would be compatible with these existing land uses.

Impacts to agriculture as a result of the proposed Project would include the removal of farmland, primarily for plant construction at either White Site 1 or 2. Permanently converted acreage of 100 acres at either site would represent a very small percentage (0.02 percent) of the total farmland in Brookings or Deuel County. This loss of farmland would not significantly affect the overall agricultural production in the county. The total value of agricultural products sold in 2007 was $186.7 million in Brookings County and $105.1 million in Deuel County. The loss in agricultural revenue in Brookings County as a result of the proposed Project would likely be immeasurable and would comprise a very small percentage of total county agricultural revenue values. These losses would be offset by revenue from about 30 new permanent jobs associated with power generation.

Temporary land use disturbances during construction could potentially impact cultivated cropland, native prairie, or pastureland. Any crop damage or loss to landowners during construction would be compensated by Basin Electric. Disturbed areas that contain grassland or pastureland would be restored and reseeded following established BMPs. The following impacts would be anticipated for each component of the proposed Project.

4.8.2.1 White Site 1 Alternative

Approximately 100 acres of existing agricultural land would be fenced for plant construction at White Site 1, which would include the plant site and an access road from 484th Avenue. Of this, 60 acres of the property would be temporarily disturbed during construction but returned to agricultural uses after construction is complete. A transmission line of 0.75 miles in length would include about 13.6 acres within a 150-foot ROW. Only a very small area of land immediately around the transmission line structures would be permanently impacted. In addition, maintenance access roads for the transmission lines would be a permanent impact. The ROW of the gas and water pipelines and the transmission lines would be available to the underlying land owner for nearly all uses, which greatly limits the level of potential impacts to land use. Some restrictions on permanent structures would be associated with the transmission lines, and the structure locations would take land permanently out of its existing use.

4.8.2.2 Water Well Supply Site B and Water Pipeline

Most of the land use impacts at Water Well Supply Site B would be temporary disturbances during construction. These temporary impacts would include disturbance of the area around two production well sites (a 200-foot by 200-foot area), as well as the area where the water pipeline would be buried. The water pipeline would be buried adjacent to 484th Avenue for a distance of 1.25 miles. Permanent impacts would result from construction of the well site and access road on cultivated cropland. In addition, two temporary and three permanent monitoring wells would be placed between the two production wells and Deer Creek.

4.8.2.3 White Site 2 Alternative

Permanent land use impacts for the power generation facility at White Site 2 would be similar for White Site 1. However, the total permanent land use impacts for this alternative are anticipated to be greater as compared to White Site 1, because the facility would require the construction of a substation about six acres in size in addition to the plant. Construction of the plant at White Site 2 would also require a Rural

Water Pipeline Extension of 6,000 linear feet from 481st Avenue to White Site 2. The pipeline would be constructed along an unimproved roadway, resulting in a new permanent ROW of about 14 acres. Potential impacts to adjacent agricultural land would be temporary during construction. A transmission line of 0.5 miles in length with a 150-foot ROW of 9.1 acres would also be constructed in association with White Site 2, resulting in temporary land use disturbances during construction and small areas of permanent impacts around the structures. The Rural Water Pipeline Extension would not affect land use.

4.8.2.4 White Site 1 Natural Gas Pipeline Route

The 13.2-mile long White Site 1 Natural Gas Pipeline would be constructed parallel to improved roadways for approximately 6.8 miles, and along new alignments not near existing roadway for 6.4 miles. Land use impacts along the route would include new permanent 75-foot wide ROW of 120 acres of mostly agricultural land during construction. For about half its length, the White Site 1 Natural Gas Pipeline would deviate from the road due to environmental constraints, property access issues, or other construction parameters. In these areas, the pipeline would have temporary impacts on agricultural land. At the point where the proposed pipeline would connect to the Northern Border pipeline, a branch would be made into the existing pipeline. The interconnection site would consist of valves, metering equipment, and instrumentation within a fenced secure area that would be approximately 50 feet by 70 feet. Additional pressure regulators and pipeline connection features would be situated immediately adjacent to the interconnection site in a separate fenced secure area that would be approximately 50 feet by 70 feet. The proposed Project would not impact any of the USFWS administered easements identified within the study area.

4.8.2.5 White Site 2 Natural Gas Pipeline Route

The White Site 2 Natural Gas Pipeline Route would be approximately 10 miles in length and would require a 75-foot ROW; the total disturbance area would be approximately 90 acres. The ROW would be constructed adjacent to improved roadways in an agricultural setting. Land use impacts include temporary disturbances to agricultural land during construction.

4.8.3 Cumulative Effects

Other past, present, and reasonably foreseeable future actions in the region that have affected land use include wind farm developments. There has been little recent development in new residences or roads. The predominantly agricultural landscape of the area has undergone changes in recent years as wind farms have been constructed. However, wind farms allow agricultural activity to continue with minimal reduction in cultivated land area. The proposed Project would have a similarly small impact to the predominantly agricultural land uses and would not contribute to a major shift in land use or loss of agricultural productivity in the area. As a result, the proposed Project is not expected to create significant adverse land use impacts, on an individual or cumulative basis.

4.9 TRANSPORTATION

4.9.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no transportation impacts associated with the No Action Alternative.

4.9.2 Proposed Project

Impacts to transportation under the action alternatives would be considered significant if:

- Congestion occurs at intersections in the proposed Project area that increases traffic delays to unacceptable levels (Level of Service D or E as defined in the *Transportation Research Board, 2000*)
- Existing roads are damaged and not restored to original condition or better
- Dust from traffic on gravel roads becomes a nuisance to local residents

Construction and operation of the proposed Project would temporarily introduce construction traffic, delivery trucks, and special heavy truck deliveries to rural county and township roads. Construction traffic would originate from I-29 to the west and use US 14 or (SD 30 to within a few miles of White Site 1. Traffic from I-29 would pass just to the south of the town of White on SD 30 and just to the north of the city of Brookings on US 14.

4.9.2.1 White Site 1

Access to White Site 1 requires travel of six or more miles on county or township roads. The primary construction traffic route from SD 30 would be south on 478th Avenue at the town of White for three miles, then east on 207th Street for six miles, then north on 484th Avenue for less than one mile to the plant site. The roadway designated as 207th Street is gravel for its entire length in the proposed Project area, as is 484th Avenue.

Construction traffic routes from US 14 could involve heading north six miles on 484th Avenue. However, since 484th Avenue is gravel for its entire length, construction traffic from US 14 would be routed on an alternate paved road to the west, 482nd Avenue.

Because of the amount of construction that would occur during both construction and normal operation, 484th Avenue from north of 207th Street to the plant entrance would be paved. The total roadway to be paved by Basin Electric is 0.75 mile. The paved roadway section would consist of four inches asphalt surface course on a minimum of six inches of aggregate base underlain by reinforcement fabric. Gravel surfaces at approaches to intersections along the designated primary access routes would be paved for a minimum distance of 300 feet to eliminate wash boarding and rutting that occur from deceleration, acceleration, and turning movements. The existing gravel surfaces to be paved would be cored to ascertain if additional base would be required. If necessary, the gravel areas may be over-excavated to accommodate the minimum base requirements. Other county and township roads would be monitored and any damage from construction traffic would be repaired and restored to original condition or better. A dust control treatment program would be implemented in areas that have residences nearby.

4.9.2.2 White Site 2

White Site 2 is located on 482nd Avenue just to the north of SD 30 and construction of a facility at the site would have the smallest impact on county and township roads, requiring just one mile of driving for construction traffic from SD 30. If White Site 2 were chosen, it is likely that wetting agents would be used to control construction traffic dust. Construction traffic for the Rural Water Pipeline Extension would use the adjacent roadways. The condition of county and township roads would be monitored and any damage from construction traffic repaired and restored to original condition or better.

4.9.2.3 Natural Gas Pipeline and Transmission Line Construction

Natural gas pipeline and transmission line construction traffic would utilize I-29, SD 30, and SD 28 to reach the vicinity of construction, and then use county or township roads adjacent to the construction corridor. The White Site 1 Natural Gas Pipeline Route would primarily use 485th Avenue in Brookings County and 484th Avenue in Deuel County. The White Site 2 Natural Gas Pipeline Route would use 481st Avenue in Brookings County and 481st Avenue in Deuel County. While pipeline construction is underway, roads would be closed for short time periods while construction equipment is being loaded or unloaded or equipment crosses roadways. Construction would occur mainly on the pipeline ROW and not obstruct roads.

4.9.3 Construction Traffic Generation and Distribution

The proposed Project is expected to require up to 360 workers on site at the peak of construction. The majority of the workers are expected to originate from Brookings with others to be in adjacent communities. The distribution of the 360 project-generated trips is tabulated below, based upon the assumption that 250 workers will live within the 12-mile study area defined by the Public Utility

Commission (PUC). The other 110 workers are anticipated to originate from outside of the study area. Worker distribution estimates were made based upon the existing available housing stock within each municipality (table 4-8) and assume that no car-pooling occurs. This would be a worst-case scenario, since most construction companies encourage car-pooling arrangements and some provide vehicles.

Table 4-8: Geographic Distribution of Construction Work Force

City/Town	Workers
***Astoria**	3
***Aurora**	9
***Brookings**	218
***Bushnell**	1
***Elkton**	12
***White**	7
Clear Lake	1
DeSmet	2
Flandreau	3
Lake Benton, MN	1
Lake Norden	1
Madison	4
Pipestone, MN	6
Sioux Falls	64
Watertown	28
Total	**360**

* Municipality within the PUC 12-mile defined study area

Based on the assumed geographic distribution of the construction work force, temporary traffic is conservatively estimated to increase on the regional roadway network (table 4-9). These values are based on single vehicular occupancy for all workers, and no consideration for regular absenteeism. This provides a worst-case scenario for traffic flow on local roads. As noted in section 4.9.6 of this EIS, even with the addition of the construction traffic all intersections will remain in good operating condition.

Table 4-9: Projected Roadway Assignment of Construction Traffic

Route	Traffic Increase (One-Way Trips)
I-29 north of Brookings	29
I-29 south of Brookings	71
US Highway 14 east of I-29	221
US Highway 14 east of 484th Avenue	19
US Highway 14 at Aurora	9
SD Highway 30 from I-29 east	11
Total	**360**

4.9.4 Equipment and Materials Shipment

Construction materials and equipment would be shipped and delivered to the site by either rail or truck. Rail shipments would be offloaded in Aurora and trucked over the roadway network to the proposed Project site. Shipments trucked directly would travel on Interstate I-29, US 14, and the local road network. Shipments coming from both north and south would likely travel over I-29 prior to leaving the interstate at Exit 132 to travel east on US 14 prior to entering the local road network.

4.9.5 Heavy Haul

Construction of the proposed Project is expected to require between 20-to-25 heavy haul loads delivered to the site, which would require transportation equipment of gross weights and dimensional characteristics in excess of standard over-the-road units. Basin Electric has initiated discussion of the heavy equipment deliveries with a specialty-hauling firm to ascertain the loads and potential routes to the site. The firm has delivered transformers to proximate facilities using 483rd Avenue and turning onto 207th Street. However, the firm expressed their preference for not using this route due to the turn and grades. Instead, the heavy equipment company would likely use 484th Avenue directly from US 14 and place a temporary 'jumper' bridge over the Deer Creek bridge structure, which may require some minor grading at the approaches. This would require closure of 484th Avenue for the period of grading and installation of the temporary bridge. This closure would be expected to last for approximately one day. The jumper bridge would be in place until all heavy haul loads are delivered.

4.9.6 Capacity Analysis

Capacity as defined in the *Highway Capacity Manual* (HCM) (Transportation Research Board 2000) is the maximum rate of flow for a roadway segment or intersection under prevailing conditions. A volume to capacity ratio (v/c) greater than 1.0 is an indication of congestion and increased potential accident rates at the location in question. By observation, the local roadway grid network provides adequate capacity to meet current and projected traffic demands that would result from the proposed Project.

Approximately 90 percent of the work force is expected to access the site from US 14 to 482nd Avenue. Capacity at this intersection was evaluated under current base conditions, and with projected peak construction traffic. Base condition peak hour traffic on US 14 in proximity to the intersection was developed from the 2008 South Dakota traffic flow maps. Additional construction traffic was then added based on the volume and geographic distribution as previously discussed.

Intersection traffic operations are evaluated using levels of service (LOS), which are ranges of average delay per vehicle entering the intersection within a 15-minute analysis period (Transportation Research

Board 2000). Under the HCM methodology, the average delay for each vehicle approaching the intersection is calculated based on available gaps in conflicting traffic streams. The range in delay, in terms of seconds per vehicle for each LOS, is listed in table 4-10 below:

Table 4-10: LOS Criteria for Stop Controlled Intersections

LOS	Average Delay (sec/veh)
A	< 10
B	10 - 20
C	20 - 35
D	35 - 55
E	55 - 80
F	> 80

Overall delay is calculated as the weighted average for each approach based on the ratio of approach volumes to the total traffic volume at the intersection. Under No Action, the HCM calculates the average delay at the U.S. 14-482nd Avenue intersection would be 0.9 seconds during the morning peak period. Under the proposed Project with an estimated 331 additional vehicles entering the intersection during the peak construction period, the average delay would be an estimated 6.1 seconds. Both of these delay values translate to acceptable LOS A based on the HCM criteria listed above. In the evening peak hour, the average delay would be 0.4 seconds under No Action and 7.4 seconds under the proposed Project, which also translates into LOS A.

4.9.7 Traffic Assignment and Routing

The vast majority of the traffic increase would be noticed on US 14 from I-29 east to the proposed Project site turnoff road. An estimated 331 construction workers would travel to the proposed Project site on US 14 east of Brookings, 19 would come from Elkton and points east in Minnesota, and 11 would come from the north over SD 30.

Construction traffic would be routed to the site via signage from US Highway 14 south of the site and SD Highway 30 to the north. From the east and west along US Highway 14, traffic would be routed north along 482nd Avenue to 207th Street, then east on 207th Street, and then north on 484th Avenue to the site. This would keep north-south traffic on the 482nd Avenue paved surface, and minimize traffic on the load-posted Deer Creek bridges on 207th Street east of 484th Avenue. Where traffic turns northbound onto 484th Avenue from eastbound 207th Street, there is a “Y” intersection where westbound traffic on 207th turns northbound on 484th by cutting the corner. Those entering onto northbound 484th from westbound 207th currently have the priority movement, as the northbound traffic on 484th has a stop sign. During construction at White Site 1, it would be advisable to place a yield sign for the traffic moving from westbound 207th onto northbound 484th and remove the stop sign on 484th. This would be a new traffic control situation at this intersection, so the following actions would need to occur:

- Remove the stop sign on northbound 484th Avenue at the 207th Street intersection
- Install a yield sign for westbound 207th Street traffic at 484th Avenue
- Install a changeable message board on westbound 207th Street approximately 100 yards prior to 484th Avenue intersection for a period of 60 days to advise motorists of the new intersection traffic controls
- Install a new construction traffic warning sign along westbound 207th at the intersection with 484th Street

From the north, along SD 30, traffic would be routed down 478th Avenue to 207th Street east to 484th Avenue, and north to the site. These changes would be implemented in cooperation with county and township road departments.

In addition to daily construction traffic, the proposed Project is expected to receive approximately 1,000 truck deliveries during the life of the proposed Project, which may include semi-trailer combinations. Delivery traffic would be routed similarly to regular construction traffic, to minimize traffic on the gravel surface of 484th Avenue south of 207th Street and over the Deer Creek bridges on 207th Street and 484th Avenue.

In addition to construction of the energy conversion facility there would be a crew working to build the necessary gas pipeline between White Site 1 and north of SD 30, primarily along 485th Avenue. The gas pipeline would be built between late July and September 2010 (to avoid impacts to Dakota skipper habitat and minimize impact to aquatic and wetland habitat) and the construction crew would consist of an estimated 70 workers. These workers would be in the area for approximately three months and should finish construction of the gas pipeline several months prior to peak construction of the power plant. It is reasonable to assume that all 70 of these workers would travel to the proposed Project site from the north via SD 30 beginning at I-29 exit 140, as the existing gas line is 13.2 miles north of the proposed Project site.

4.9.8 Mitigation

Gravel surfaces at approaches to intersections along the designated primary access routes would be paved for a minimum distance of 300 feet to eliminate wash boarding and rutting that occur from deceleration, acceleration, and turning movements. The intersection segments would be paved to the extent necessary to provide the adequate tapers and radii for semi-trailer movements, which may require local ditch grading and location adjustment. Any additional grading outside of areas not previously surveyed or outside of existing ditches would require biological and cultural surveys. The 0.75-mile segment of 484th Avenue from 207th Street north to the project entrance is recommended to be paved, as this roadway will serve not only all construction traffic, but also the traffic generated by regular operations of the plant following its completion. In an effort to control dust along the gravel section of 207th Street, an appropriate treatment program would be developed in coordination with the county and township.

The recommended improved paved roadway section would consist of four inches of asphalt surface course on a minimum of six inches of aggregate base underlain by a reinforcement fabric separator. The existing gravel surface could be used as the aggregate base course, but should be inspected and measured to assure the minimum six inches is available. If necessary, the gravel areas may be over-excavated to accommodate the minimum base requirements prior to placement of the reinforcement fabric. In addition to its primary function as a separator, the fabric also provides strength if placed properly.

Since the local roadways and bridge structures that would be used fall under several different jurisdictions (Brookings County, Alton Township, Sherman Township, and Richland Township), a multi-party agreement would be developed which clearly defines limits of maintenance responsibility throughout the proposed Project. The condition of county and township roads would be monitored and any damage from construction traffic repaired and restored to original condition or better.

4.9.9 Cumulative Effects

The primary transportation and traffic impacts associated with the proposed Project would be associated with construction activity over a period of three years, 2010 – 2012. There is a proposal to construct 105 wind turbines in an area of approximately 35,000 acres to the north and west of the proposed Project site. This activity is likely to occur within the next few years as the economy improves and funding can be obtained. This would bring additional construction traffic to US 14 and SD 30 and the connecting local roads in the region. The 105 wind turbine sites are spread out over a large area and there would not be a continuous stream of construction traffic going to one site. This means that the traffic on local roads will vary over the construction period of approximately eight months. No other major construction activities have been identified for that time period. Because of the dispersed nature of the wind turbine construction, there would not likely be cumulatively significant traffic increases on any one road segment and, if there were, it would be a very temporary situation.

On an individual or cumulative basis, the proposed Project would not cause traffic delays to unacceptable levels D or E. Existing roads would be improved within the area to accommodate the proposed Project and wind turbine development. Road improvements would decrease the potential for nuisance dust; however, dust would be monitored and suppression measures incorporated into the proposed Project construction and operation plans. As a result of these measures, no significant adverse transportation impacts would occur.

4.10 VISUAL RESOURCES

4.10.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no visual impacts associated with the No Action Alternative.

4.10.2 Proposed Project

Potential thresholds for scenic quality would include visibility from designated scenic roadways, or scenic overlays designated in zoning ordinances. The following criteria were used to identify potentially significant changes to the scenic integrity of the landscape as viewed from sensitive viewpoints, such as transportation routes or residential areas:

- A high visual contrast with the surrounding landscape is introduced
- Creation of a new source of substantial light or glare, which would adversely affect day or nighttime views in the area

4.10.2.1 Impacts Common to Both Site Alternatives

The proposed Project would introduce new or different elements into the predominantly gently rolling terrain of eastern South Dakota and would alter the existing forms, lines, colors and texture that characterize the existing landscape. The proposed Project’s components were categorized as low (or level with the horizon line), moderate (less than 100 vertical feet), and tall (over 100 vertical feet) to aid in assessing visual impacts. In this area, the proposed Project could generally be seen from four miles, and the visual impact assessment area includes this distance. However, lights would generally be noticeable from a one-mile radius, and that radius is used for assessment of impacts from lighting.

Temporary impacts to the visual resources of the proposed Project area would include increased off-site vehicular traffic from maintenance and employee vehicles along major roads in and around the area during the construction phase. Site clearing and associated dust, borrow pit excavation, commissioning (steam blowout), and well drilling would also contribute to the visual impacts on the existing landscape. The presence of one or more large cranes would represent the most visible equipment or facilities used during the construction phase. In general, construction activities would create high visual contrasts during a short period of time in areas within four miles of the site, depending on the phase of construction and the location of the viewer. However, in many cases, construction projects become a focal point of interest of local residents. This high interest in the proposed Project may offset temporary visual impacts during the construction phase.

Most of the proposed Project's components would lie level with or slightly above the horizon once constructed. These components, whose blocky, angular forms and smooth-textured, engineered appearance contrast with the forms, lines, colors, and textures of the existing landscape character, include the following:

- Internal paved roads
- Local road modifications and primary access points
- Stormwater channels
- Onsite parking
- Water and natural gas supply system, including underground pipelines
- Evaporation pond
- Security fencing
- Water well control building and associated transformer
- Pitless water well unit
- Off- and on-site signage

Contrasting components with moderate height include the following:

- Air-cooled condenser (100 feet)
- Turbine building (93 feet)
- Administration building (22 feet)
- Ammonia storage tanks (18 feet)
- Water and wastewater treatment buildings (34 feet)
- Transformers (10 feet)
- Switchyard (75 feet)
- Water storage tanks (48 feet)

The tallest structures and equipment associated with the generation site include the following:

- Exhaust stack (150 feet)
- Transmission line structures (85 feet)

Most buildings on the generation facility site would feature light blue or white metal siding and a blue or white metal roof. Most storage tanks would be painted white. The HRSG and associated structures would be constructed with a light gray/silver metal. The transmission structures and associated switchyard equipment would be constructed using light gray/blue galvanized steel.

Several effects to visual resources would result from the introduction of the generation facility once constructed. The transmission structures and HRSG equipment would introduce prominent vertical lines perpendicular to the landscape that would create a moderate to strong contrast with the horizontal to generally horizontal plane of the surrounding landscape. The air-cooled condenser and turbine building would introduce large, angular block forms to the horizontal landscape. The light blue metal siding of the majority of buildings would introduce a color contrast to the landscape, because there may be a glare from the buildings when sunlight is reflected off the metal siding.

The FAA does not require notification for the construction of facilities that are less than 200 feet in height, so it is not anticipated that FAA would require fitting of either daytime or nighttime indicator lights for the Deer Creek Station. However, there would be some general facility lighting that would be installed to provide safe and effective operation of the facility at all hours.

General facility lighting would introduce a new visual element to the landscape. During daylight hours, the lights may be visible, but they would not be intrusive to viewers in the proposed Project area and are unlikely to create a high visual impact. The lights would be most noticeable during nighttime hours from residential properties within one mile of the generation site. There is one occupied residence about one mile away from White Site 1 and one occupied residence within 0.5 miles of White Site 2. These residences would likely be able to see the facility, although the residence at White Site 2 would be closer and not as screened by topography and vegetation. Although visual resources from some vantage points would be affected because of the facility lighting, impacts at the community level are expected to be insignificant because it is a sparsely populated rural area. No designated natural areas, parks, or historic sites are nearby, and therefore lights would not have the potential to affect the character of any scenic resources. Lights would be designed with shielding or cutoff optics to avoid unnecessary lighting of the surrounding area.

The degree of contrast between the generation facility and the surrounding landscape would depend on the distance of the facility from an individual viewpoint. The strong vertical lines of the transmission structures and the HRSG, together with the angular block forms of the air cooled condenser and turbine building, would dominate the landscape in the immediate foreground (up to 0.5 mile) of unobstructed views from individual viewpoints located on county and township roads and residences. As indicated above, this would affect one residence at each site and only casual viewers on rural roadways. The most potential drive-by viewers would be traffic on SD 30. The contrasts would be moderate in middle-ground views up to four miles, because the tallest structures would still be visible, but these structures would not be the dominant features on the landscape. Some structures of moderate height and most structures of low height would be screened by rolling topography and standing crops from some views. The textures of most structures on the generation site would be indiscernible from distances of more than four miles. However, the form and color of the largest structures (transmission structures, HRSG, air-cooled condenser, turbine building) may still be visible depending on atmospheric conditions, and may create a low to moderate contrast with the surrounding landscape.

4.10.2.2 Impacts Unique to Each Site Alternative

Impacts on visual resources for each site alternative were determined by considering photo simulations of post-construction views from select key observation points (KOPs) in the proposed Project area (EDAW 2009d). Figure 4-3 shows a map of where the photos for the simulations were taken.

4.10.2.3 White Site 1

The turbine building, transmission structures, and HRSG would be highly visible in views to the north, west, and south from the county and township roads near the generation facility site (figure 4-4). These tall, vertical structures would create a high degree of contrast with the surrounding landscape. The existing 345-kV transmission line can be clearly seen on the horizon.

In addition to the visual impacts of the generation facility, another new visual feature introduced to the landscape would be a transmission line. However, this would be adjacent to other nearby transmission lines already existing in the area and connecting to White Substation. The additional visual contrast would be minimal.

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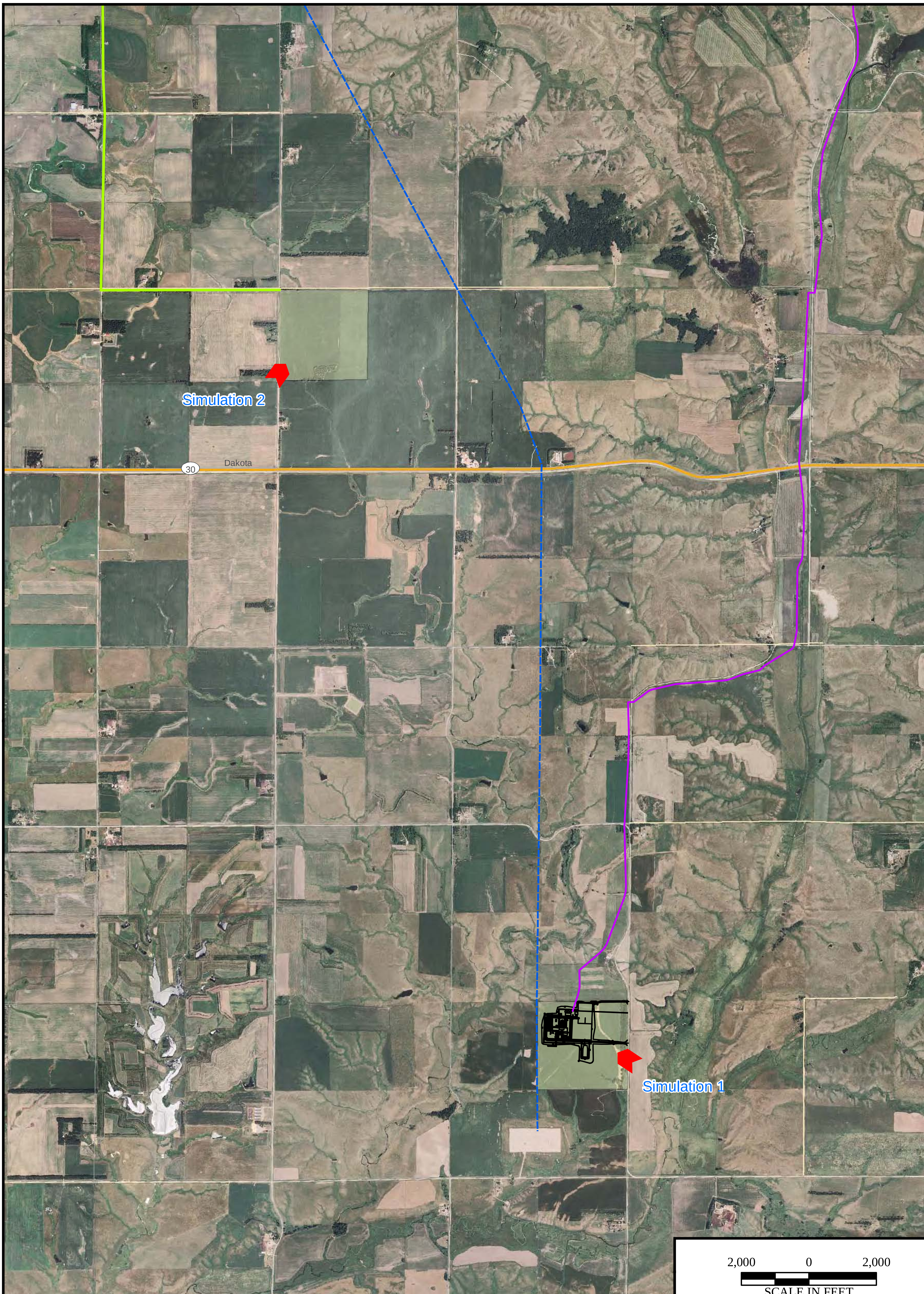

LEGEND

- White Site 1 Pipeline
- White Site 2 Pipeline
- White Site 1 Plant Layout
- White Site 1 and 2 Boundaries
- Photo Simulation Point
- 345-kV Transmission Line

NORTH

Source: USDA NAIP County Mosaic, Brookings and Deuel counties, North Dakota;
ESRI; Basin Electric Power Cooperative

Figure 4-3

Locations of Photo Simulations
Deer Creek Station EIS

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Figure 4-4 Photo Simulations: White Site I (Simulation 1)

When viewed from longer distances of up to four miles, the visual impacts of the generation site would be further reduced from moderate to low, due to dozens of turbines from the existing wind farm southeast of the site. The turbines would appear almost twice as tall as the HRSG on the generation site when viewed from distances of more than four miles, creating a situation where the visual impacts of the generation site would be insignificant. The White Site 1 Natural Gas Pipeline and the water well supply site and pipeline would not be visible except during construction. Small markers indicating the presence of the pipeline facilities would be placed at road crossings. The pipelines would not have long-term visual impacts. The visual impacts from White Site 1 would affect few people based on the distance of White Site 1 to SD 30 (approximately 3.5 miles to the north) and the sparsely populated area surrounding the site. During the period of plant operation, the shelterbelt along the eastern side of the plant site would be maintained to provide visual screening.

4.10.2.4 White Site 2

White Site 2 is approximately 0.5 mile north of SD 30 and would therefore be seen by more travelers and residents of the area than would see White Site 1. The ADT on SD 30 is approximately 700 vehicles. Unlike White Site 1, White Site 2 would require an on-site substation to be constructed (figure 4-5). This substation, the turbine building, and the HRSG create a high degree of visual contrast with the surrounding landscape. In views toward the north and east from the county and township roads adjacent to the site, the existing 345-kV transmission line and existing wind turbines are not visually dominant features on the landscape and the visual impacts created by the structures of the generation facility would not be lessened. However, given the site’s close proximity to SD 30, a greater number of viewers would see the generation site if White Site 2 were selected.

In addition to the visual impacts of the generation facility, another new visual feature introduced to the landscape would be a transmission line and substation. The substation would be to the south of the generation facility and would likely be perceived by viewers as part of the same industrial facility. In addition, the White Site 2 transmission line would be adjacent to other nearby transmission lines already existing in the area. The additional visual contrast would be minimal.

The White Site 2 Natural Gas Pipeline and the Rural Water Transmission Line would not be visible except during construction. Natural gas pipeline markers would be installed and maintained over the buried pipeline at road crossings and other locations to reduce the risk of inadvertent damage or interference. The markers would identify the owner of the pipeline and convey emergency information in accordance with applicable regulations, including 49 CFR Part 195 safety requirements. The pipelines would not have long-term visual impacts.

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Figure 4-5 Photo Simulations: White Site II (Simulation 2)

Existing Conditions

Proposed Structures

4.10.3 Cumulative Effects

Cumulative visual impacts at White Site 1 would be created by the addition of several turbines of the White Wind Farm, which would be visible in the view in the future. These turbines would be the tallest and most visible objects on the landscape, with a ground-to-nacelle height of approximately 300 feet. The presence of the 345-kV transmission line, together with the future presence of the wind turbines of the White Wind Farm, create a situation where the visual impacts of White Site 1 would be reduced from a high degree of contrast to a moderate degree of contrast. The angular block form and light blue color of the turbine building would create some degree of visual contrast, but its impacts would be lessened when compared to a site that was completely free from industrial or utility development.

Cumulative visual impacts at White Site 2 would be created by several proposed turbines from the White Wind Farm to the west and south from SD 30. The presence of these turbines would lessen the visual contrast and thus lessen the visual impacts of the structures on the generation site.

On an individual or cumulative basis, the proposed Project would not significantly affect scenic roadways or scenic resources of the area. Both White Site 1 and White Site 2 would introduce adverse visual impacts once constructed, especially when viewed from distances within 0.5 mile. White Site 2 would be seen by a greater number of viewers along SD 30 and would introduce an on-site substation to the proposed Project site. Both sites would be equipped with lights for nighttime operation, but the lights from White Site 2 would affect a greater number of viewers along SD 30. Overall, White Site 1 would introduce fewer structures on the existing landscape, would be located in an area with existing (or soon to be existing) visual disturbances, would affect fewer people, and would therefore have less of a visual impact on the landscape. Wind farm construction in the area has reduced the potential cumulative visual impacts of the proposed Project.

4.11 NOISE

4.11.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no noise impacts associated with the No Action Alternative.

4.11.2 Proposed Project

The land in the vicinity of the proposed Project is generally used for agricultural and residential purposes. Because the area is windy, background noise levels are high, ranging from 54 to 70 dBA. Wind is a pervasive component of noise in the area. There are minimal human-generated noise sources in the area, with vehicular traffic and farming equipment being the primary sources of human-generated noise in the surrounding area. Background noise levels vary by time of day. Implementation of the proposed Project may have a significant noise impact if it would result in any of the following:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies
- A permanent increase of more than 6 dBA measured at the property line of a sensitive receiver; a 6 dBA noise level increase is considered clearly noticeable, while a 10 dBA increase is a doubling of the sound level
- A substantial temporary or periodic increase in ambient noise levels in the proposed Project vicinity above levels existing without the proposed Project over the long term

Potential noise impacts resulting from implementation of the proposed Project include increased noise levels near sensitive noise receivers such as residences. An analysis was completed to ensure that the proposed Project is located and designed appropriately from a noise perspective and to evaluate the noise impact on the surrounding community. The analysis focused on the nature and magnitude of the change in the noise environment associated with implementation of the proposed Project.

4.11.2.1 Construction Noise

The proposed Project has the potential to cause a localized and temporary increase in ambient noise levels near roadways used for transporting equipment and materials; and around the construction of pipelines, transmission lines, and the electrical generating facility. There would also be an increase in traffic in the area during the construction of the facility, pipeline and transmission line, which would also temporarily increase noise levels in the area. The actual noise levels generated by construction would vary on a daily and hourly basis, depending on the activity that is occurring, and the types and number of pieces of equipment that are operating. The U.S. EPA has compiled data regarding the noise generating characteristics of specific types of construction equipment and typical construction activities. This data is presented in table 4-11 and table 4-12.

Table 4-11: Noise Ranges of Typical Construction Equipment

Equipment	Noise Levels (Leq, dBA) at 50 feet[1]
Back Hoe	73-95
Compressors	75-87
Concrete Mixers	75-88
Concrete Pumps	81-85
Cranes (moveable)	75-88
Cranes (derrick)	86-89
Front Loader	73-86
Generators	71-83
Jackhammers	81-98
Paver	85-88
Pile Driving (peaks)	95-107
Pneumatic Impact Equipment	83-88
Pumps	68-72
Saws	72-82
Scraper/Grader	80-93
Tractor	77-98
Trucks	82-95
Vibrator	68-82

[1]Machinery equipped with noise control devices or other noise-reducing design features do not generate the same level of noise emissions as shown in this table.
Source: Bolt, Beranek, and Newman 1971

Table 4-12: Typical Outdoor Construction Noise Levels

Construction Phase	Noise Level at 50 feet (L_{eq}, dBA)	Noise Level at 50 feet with Mufflers (L_{eq}, dBA)
Ground Clearing	84	82
Excavation, Grading	89	86
Foundations	78	77
Structural	85	83
External Finishing	89	86

Source: Bolt, Beranek, and Newman 1971

It is generally accepted that the noise levels diminish rapidly with distance from the construction site at a rate of approximately six dBA per doubling of distance. For example, a noise level of 84 dBA measured at 50 feet from the noise source to the receptor would reduce to 78 dBA at 100 feet from the source to the receptor, and reduce to 72 dBA at 200 feet from the source to the receptor.

Once construction is near completion, a short-term occurrence of loud steam blows would impact nearby neighbors. The steam blows would be necessary to remove debris in the steam turbine prior to initial startup of the units. The steam blows would occur during the daytime for approximately two to four weeks depending on the number of blows that are required to meet the cleanliness requirements of the steam turbine vendor. The typical sequence time is five minutes per blow and 30 - 60 minutes between blows to re-fill the drums, heat the water and repressurize. The steam blows would be expected to generate a noise level near 115 dBA at three feet from the steam vents. This noise level would be approximately 55 dBA at the nearest residence when it occurs. Because this is a short-term event, this noise level would not significantly impact the nearby residences.

Traffic noise would be expected during construction, and may be most noticeable to residences during early morning and late afternoon. However, this would be short-term in duration.

4.11.3 Operational Noise

In order to evaluate expected noise levels from the operation of the proposed Project, noise generation from individual sources (such as the combustion turbines, steam turbines, cooling systems, and various other lesser sources) was modeled. The industry-accepted noise modeling software, Computer Aided Design for Noise Abatement (CadnaA), was used during modeling. Equipment sound power levels are used in the model to predict sound pressure levels at nearby locations. Even though all equipment may not be operating at the same time (i.e. – some equipment may only operate during start-up) all equipment that emits sound was included in the model and assumed to operate at the same time. This provides a conservative estimate of the noise from the proposed Project. Table 4-13 displays the noise-emitting sources that were modeled and their corresponding sound power levels.

In the model, attenuation was included for sound propagation over vegetation, terrain, barriers, and shielding. The atmospheric conditions were assumed to be calm and the temperature and relative humidity were set to 50 degrees Fahrenheit and 70 percent, respectively (based on program defaults).

Table 4-13: Modeled Overall Sound Power Levels

Unit	Overall Sound Power Level, dBA
CT Inlet Ducting	86.5
CT Inlet Filter Face	98.7
CT Accessories	103.4
CT Inlet Plenum	102.2
CT Turbine Compartment	110.2
CT Exhaust Diffuser	110.2
CT Load Compartment	104.4
CT Generator	107
CT Compt Vent Fans	103.8
CT Exhaust Enclosure Vent Fans	102.2
CT Exhaust Expansion Joint (inside gas)	145.3
Step-Up Transformer	93.7
Auxiliary Transformer	87.5
Steam Turbine Generator	92.4
Steam Turbine	92.5
STG Building Fans	81.9
ST Generator Slip Ring House	92.5
Steam Trunk Main Start Up	103.1
Steam Trunk Duct 2a Start Up	101.1
Steam Trunk Duct 2b Start Up	100.1
Steam Trunk Duct 3 Start Up	96.2
Steam Trunk Duct 4 Start Up	93.1
H1 HRSG Inlet Duct	111.2
H2 HRSG Module 1-3	102.2
H3 HRSG Module 4-7	97.2
Stack Exit	110.0
Boiler Feedwater Pump	109.9
Air Cooled Condenser (total fan assembly)	99.8
FIN FAN Cooler	98.5

Receptors were placed in the model at locations that correspond to the locations where ambient measurements were taken, including at the closest sensitive noise receivers. Modeled plant operational noise levels, associated solely with the operation of the proposed Project, were logarithmically added to minimum noise levels for each measurement point. The predicted and overall operational sound levels for the modeled receptors are shown in table 4-14.

Table 4-14: Estimated Operational Noise Levels

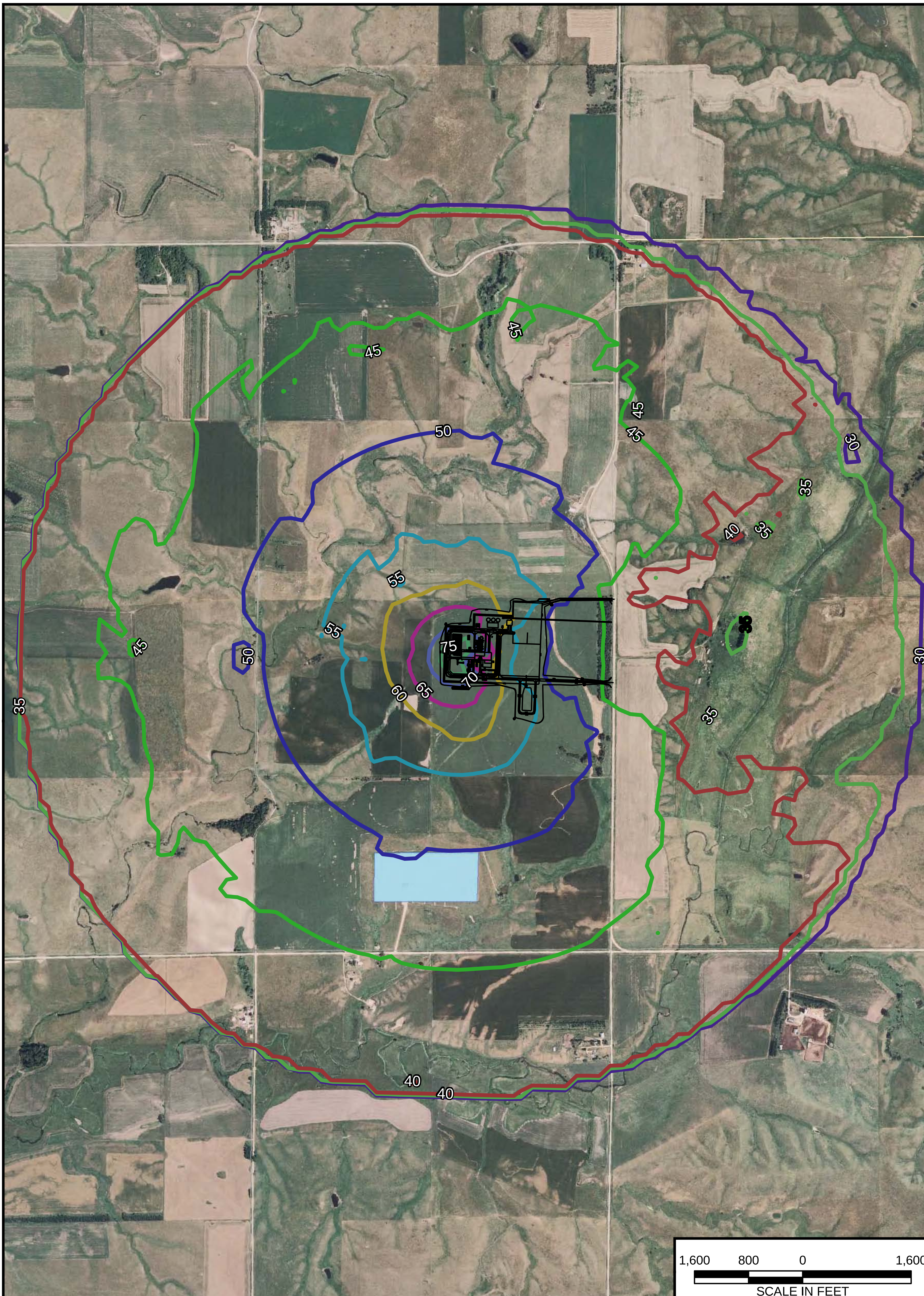
Measurement Point	Minimum Measured Noise Level (L_{eq}, dBA)	Modeled Plant Noise Level (L_{eq}, dBA)	Estimated Total Operational Noise Level (L_{eq}, dBA)
MP1*	43	45	47
MP2	48	51	53
MP3*	52	41	52
MP4*	42	43	45
MP5*	49	45	50
MP6*	39	44	45
MP7	42	54	54

*Represents sensitive noise receiver (residence)

Figure 4-6 displays the sound contour levels in 5-dBA increments for the area surrounding White Site 1.

The maximum increase in noise levels at the sensitive noise receivers is projected to increase by no more than six dBA over the background noise levels. This noise level is considered noticeable, but is not considered a significant increase in the sound level at the receiver.

The Department of Housing and Urban Development (HUD) has development guideline noise levels for HUD housing. This level is 65 dBA L_{dn}, where L_{dn} is a day-night average noise level in which a 10 dB penalty is applied to the nighttime noise levels. Essentially, the nighttime noise level should be below 55 dBA and the daytime noise level should be below 65 dBA. Since the greatest contribution to noise levels in the area at any residence is modeled to be at 45 dBA, the proposed Project would be within the HUD guideline noise levels. Because distances between residences and the White Site 2 Alternative are closer than the White Site 1 Alternative, noise impacts to residences from White Site 2 would be slightly higher than for White Site 1, but still predicted to be within HUD guidelines.



LEGEND

White Site 1 plant Layout

White Substation

Predicted Noise Level Contours

30 dBA
35 dBA
40 dBA
45 dBA
50 dBA
55 dBA
60 dBA
65 dBA
70 dBA
75 dBA

Source: USDA NAIP County Mosaic, Brookings and Deuel counties, North Dakota; FEMA; ESRI; Basin Electric Power Cooperative

NORTH

Figure 4-6

Sound Contour Levels
White Site 1
Deer Creek Station EIS

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4.11.4 Cumulative Effects

The White Substation and the Xcel Energy Brookings County substation just to the east will contribute to ambient noise in the vicinity of White Site 1, especially to the residences located within one mile of White Site 1 to the south. Due to the unique sound profile of transformers, the substations may be audible under certain meteorological conditions. However, cumulative noise levels associated with the substations and the proposed Project are expected to be similar to the already predicted noise levels.

Given the high background noise in the area, these sources would not likely be noticeable on most days. Additionally, an existing wind farm is located approximately three miles east of the proposed Project site and a proposed wind farm may be constructed approximately 0.5 mile to the west of the proposed Project. Noise associated with the existing wind farm is not expected to contribute to ambient noise near the proposed site; however, noise associated with the proposed wind farm may contribute to the ambient noise near the proposed site. Temporary cumulative noise impacts are possible from the construction of wind farms in the area. The current noise standard for the White Wind Farm is 50 dBA at the property line of existing residences, businesses, and public buildings. Noise from wind farms is a swishing or lashing noise and is different in character from those generated by a combustion turbine. Multiple wind turbines operating at the same time would create the swishing sound at different times. These non-synchronized sounds would blend together to create a more constant sound to an observer at most distances from the wind turbines. It is expected that the hum of the White Wind Farm and either White Site 1 or White Site 2 would blend in with the existing ambient noise and should not affect the aforementioned noise impacts. The proposed Project, on an individual or cumulative basis, would not exceed noise standards, cause a permanent increase of noise at the property line, or cause noise levels to substantially increase above current levels. Significant noise impacts would not be a result of the proposed Project.

4.12 PUBLIC HEALTH AND SAFETY

4.12.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no public health and safety impacts associated with the No Action Alternative.

4.12.2 Proposed Project

Public services in the area are designed to handle current issues. A significant impact to public health and safety would occur if the proposed Project resulted in:

- Violation of local, State, or Federal regulations regarding the handling, transport, containment, or disposal of regulated and hazardous materials
- Interference with emergency response capabilities or resources
- Violation of OSHA standards and failure to secure the site against unauthorized public access

4.12.2.1 Construction and Operational Personnel

Potential health and safety hazards are generally greater during the construction phase of the proposed Project. These risks are due to heavy equipment operation, overhead materials and cranes, and use of construction tools. Construction personnel are at a higher risk than the general public during this phase of the proposed Project, but the risk is temporary. Construction-related hazards can be effectively mitigated by complying with all applicable Federal and State occupational safety and health standards. Adherence to these standards, and applicable National Electrical Safety Code regulations and utility design and safety standards, would protect construction workers from unacceptable risks.

Basin Electric would develop a Health and Safety Plan to address public and worker safety during the construction and operation of the proposed Project. The Health and Safety Plan would identify requirements for minimum construction or operation distances from residences or businesses, as well as requirements for temporary fencing around staging, excavation, and laydown areas during construction. The Health and Safety Plan would identify measures to be taken during operation to limit public access to proposed Project facilities (i.e. permanent fencing around the generation facility, locked gates at access road entrances). Potential safety risks would be greater during the construction phase of the proposed Project. The Applicant's Health and Safety Plan would include provisions for worker protection as is required under OSHA with emphasis on CFR 1926 – *Safety and Health Regulations for Construction.*

All construction sites would be managed to prevent harm to the general public. During construction, all employees, contractors, and sub-contractors would be required to conform to OSHA safety procedures. Adequate training would be mandatory for all construction workers on site. Heavy equipment would be in compliance with OSHA requirements for safety devices such as back-up warnings, seat belts, and rollover protection. Personal safety equipment such as hard hats, ear and eye protection, and safety boots would be required for all workers on site. Accidents and injuries would be reported to the designated safety officer at each site.

There would be a risk of accidental fire during construction and operation of the proposed Project. Risk of accidental fire during construction would occur from human activities such as refueling, cigarette smoking, and use of vehicles and construction equipment in dry, grassy areas. The health and safety plan would address these risks, and the risks would be reduced to acceptable levels by restrictions or procedures regarding these activities. A risk of fire would be present during operation of the generating facility due to the use of natural gas and the storage of chemicals within the facility. Implementation of industry-approved design measures for all facility components would ensure that the risk of an incident causing injury or property damage would remain acceptably low. The proposed Project would have a built-in fire suppression system. However, if needed, fire services would be provided by the local volunteer fire department. The closest volunteer fire service is located in White. Other fire services are available in Brookings, Volga, Estelline, and Aurora, South Dakota.

Construction and operation of the proposed Project would involve the use and storage of regulated and hazardous materials. During construction, diesel fuel, gasoline, and lubricating oils from heavy equipment and vehicles could be accidentally leaked or spilled. Hydraulic fluid, paints, and solvents would likely be used during the construction phase as well. To reduce the potential for a release of regulated or hazardous materials during the construction phase of the proposed Project, work would be planned and performed in accordance with OSHA standards and protocols addressing the use of potentially hazardous materials and applicable Federal and State environmental regulations. If a hazardous release occurred, cleanup, management, and disposal of contaminated soils would be conducted according to EPA and State standards. Conformance to these standards and procedures should reduce the potential for significant impacts resulting from the release of hazardous materials during the construction phase. Personnel would be trained in spill containment, and would have clean-up materials immediately available for use. Natural gas, a flammable fuel source, would be used during operation of the generating facility. Diesel fuel and ammonia tanks would also be stored on-site. These materials could be directly harmful to wildlife if they are leaked or spilled, and could affect aquatic habitat if water sources are contaminated. These materials are also flammable and present a fire hazard if not properly stored. Storage for these materials would be designed to code and accepted practice, thus reducing the risk from having these materials on site.

Typical hazardous substances that would exist on-site are listed in table 4-15.

Table 4-15: Potentially Hazardous Chemicals to Be Used at Deer Creek Station

Equipment	Purpose	Product	Storage Vessel	Storage Volume	Use Rate	Estimated Annual Use Rate
SCR	NO_x Control (Main Stack)	Anhydrous Ammonia	Metal Tank	2000 Gallon, 1700 of useable space	40 lb/hr	15,000 gal
Emergency Diesel Generator	Emergency Electrical Generation	Low Sulfur Diesel	Metal Tank	3000 Gallon, 2500 useable Gallon	105 gal/hr	52,500 gal
Emergency Diesel Fire Pump	Emergency Fire Protection	Low Sulfur Diesel	Metal Tank	700 Gallon	29 gal/hr	14,500 gal
Condensate and Boiler Feedwater Treatment	pH Adjustment	Aqueous Ammonia	Totes	300 Gallon	1.25 gal/hr	3700 gal
Condensate and Boiler Feedwater Treatment	Oxygen Scavenging	Carbohydrazide	Drums	55 Gallon	0.15 gal/hr	450 gal
Condensate and Boiler Feedwater Treatment	Boiler pH Control and Buffering	Phosphate	Pails	25 lb	0.05 lb/hr	150 gal
Makeup Water Treatment		Sulfuric Acid	Totes			
Makeup Water Treatment		Caustic	Totes			
Makeup Water Treatment		Sodium Hypoclorite	Totes			
Makeup Water Treatment	Anti-Scalant	GE Betz Hypersperse or equal	Totes			
Makeup Water Treatment	Softener	Sodium Bisulfite Sodium Chloride				
Makeup Water Treatment	RO Cleaning Agent	Citric Acid				
HRSG	HRSG blanketing	Nitrogen	330 cubic foot cylinder(s) or 40,000 cubic foot tube trailer	11,880 cubic ft (three 12-packs of cylinders) to 40,000 cubic ft	Normal is zero.	10,000 cubic ft (one complete HRSG fill)
Gas Turbine	Gas Turbine Generator Purge	CO_2	330 cubic foot cylinder(s)	11,880 cubic ft (three 12-packs of cylinders)	Normal is zero	8,000 cubic ft (one complete generator purge)
Gas Turbine	Gas Turbine Fire Protection	CO_2	Metal tank	104,000 cubic ft	Normal is zero	Normal is zero
Gas Turbine	Gas Turbine Generator Cooling	Hydrogen	330 cubic foot cylinder(s) or 40,000 cubic foot tube trailer	11,880 cubic ft (three 12-packs of cylinders) to 40,000 cubic ft	300 cubic ft/day	118000 cubic ft (one complete generator fill plus daily use)

Source: Basin Electric Power Cooperative

4.12.2.2 General Public

The general public would not be allowed to enter any construction areas associated with the proposed Project. The major risk to the general public would be from increased traffic volume on the roadways in the proposed Project area as a result of commuting construction workers and transportation of equipment and materials. Additionally, local gravel roads and bridges would need to be upgraded by improving the roadway gravel thickness and leveling to accommodate the increased volume and loads associated with construction. A bridge on 484th Avenue would be spanned with a temporary bridge structure to accommodate the heavy haul loads. The temporary bridge structure span would be removed after the heavy haul loads are delivered (section 4.9). During upgrades, short-term road closures may be necessary, which could interfere with emergency equipment. The Applicant would develop and implement appropriate traffic management and road improvement plans as needed during construction. All oversized and heavy equipment vehicle operators would be required to observe all applicable rules and regulations for safe transport of oversize loads on public highways and local roadways.

The proposed Project involves the construction of a short transmission line to connect the generation facility with a nearby substation. The proposed transmission line for White Site 1 would be 0.75 mile in length, and the proposed transmission line for White Site 2 would be 0.5 mile in length. Electromagnetic fields (EMF) are often raised as a public concern with electric transmission lines and substations. EMF exists around all electrical devices, and most of the exposure to EMF comes from common household appliances. Levels of EMF from the proposed transmission lines would be low and would fall off rapidly with distance from the line. A large number of scientific studies involving physics, epidemiology, and cell biology have studied the potential for human health risks for over 30 years, with inconclusive results. There are no Federal standards for EMF exposure from transmission lines; however, some states, including Minnesota, have standards. The Minnesota standard is eight kV/m for electric fields, but there is no standard for magnetic fields. Magnetic field limits for states with standards such as Florida and New York are in the 200 milligauss range. A typical electric field from a high-voltage transmission line (such as 500 kV lines) at maximum load would be about one kV/m at 100 feet. Magnetic fields from 500 kV lines are typically less than 13 milligauss at 100 feet (NIEHS 2002). Levels from 345-kV lines, such as would be used in the proposed Project, are lower than levels from 500-kV lines. EMF fields from substations are rarely measurable above background levels when measured beyond the substation fence. These levels suggest that there is no potential for an exposure level from the proposed Project that would have effects to public health.

Because conformance to OSHA, EPA, and State regulations would be required, facility operation and maintenance procedures, as well as contingency planning, would be established to prevent or mitigate impacts from possible release of regulated or hazardous materials during operation of the proposed Project. The facility would develop and implement release prevention and emergency response plans and would train all personnel on the plans. Conformance to Federal and State regulations, as well as prevention and emergency response plans, should reduce the potential for significant impacts resulting from the release of regulated or hazardous materials during the operational phase of the proposed Project.

4.12.3 Cumulative Effects

Past, present, and reasonably foreseeable future actions in the area with public safety implications are the use of agricultural chemicals, the presence of electric transmission systems in the area, and wind turbine construction and operation. The proposed Project would not add to risks from use of agricultural chemicals. The proposed Project would add to risks from electric utility development in the area, although the amount of risk would only be from a new 0.5 to 0.75-mile transmission line. The new transmission line, as well as the new wind turbines, would be expected to be in compliance with Federal, State, and local regulations for regulated and hazardous materials usage. The proposed Project would create a small potential for increase in accident rates for transportation facilities. The proposed Project, together with the existing and proposed wind farm developments, would comply with all Federal, State, and local regulations for construction and operation safety and the public would not be allowed in active construction areas. Therefore, the construction of the proposed Project would not be expected to significantly increase cumulative public health and safety risks.

4.13 INTENTIONAL DESTRUCTION

Security measures summarized in this section are in accordance with Security Guidelines (www.esisac.com) published by the North American Electric Reliability Corporation (NERC 2001).

4.13.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no security impacts associated with the No Action Alternative.

4.13.2 Proposed Project

The proposed Project, which would be located adjacent to the existing White Substation, is a combined-cycle power generation facility designed to nominally produce 300 MW of electricity. Its small physical size, use of natural gas as fuel, and remote location make it a relatively undesirable target for aggressors, and the threat of damage from terrorists or activists is considered negligible. The loss of 300 MW supply to the regional grid could be tolerated by the system, resulting in little to no loss of power service to customers. Few residents or population concentrations are located within close proximity of the proposed site. Theft of recyclable metals and equipment, and random vandalism, are likely to pose the most serious security issues. Since the generation plant would be manned, theft issues should be minimal. Materials thefts are more common at unmanned substations, and vandalism often takes the form of shooting insulators on transmission lines.

Fences, gates, or barriers, coupled with the use of keying systems, access card systems, or security personnel at entry points, would restrict access to the facility at White Site 1, White Site 2, and Water Well Supply Site B. Use of these physical obstructions and warning signage effectively deter and delay intruders. Personnel identification and control measures such as photo IDs, visitor passes, and contractor IDs help quickly identify unauthorized persons within the facility.

In addition to physical security, the proposed Project would be protected against cyber threats (i.e. hackers attacking computer control systems and information). Access to control systems would be managed to protect critical assets and information as well as maintain the reliability of the electric infrastructure. This includes logical access (user password protection) to computers and networks and physical access to computer rooms. Policies and procedures would be established to manage authorization and authentication as well as monitor both logical and physical access. Firewalls would be implemented and proactively maintained. Intrusion detection systems would be implemented and cyber risks regularly evaluated.

4.14 CULTURAL RESOURCES

Existing information on cultural resources was collected within a one-mile radius of an area bordered by the NBPL on the north, the White Site 1 Natural Gas Pipeline Route on the east, the White Site 2 Natural Gas Pipeline Route on the west, and 205th Street on the south. This includes the area of all proposed facilities including the two alternative sites, road improvements, gas pipelines, water pipelines, water well sites, and transmission lines. Gravel surfaces at approaches to intersections would be paved to the extent necessary to provide the adequate tapers and radii for semi-trailer movements, which may require local ditch grading and location adjustment. Any additional grading outside of existing ditches would require cultural surveys. Surveys in the study area for wind farms and other area and linear projects have recorded 53 archaeological sites, of which 50 are prehistoric sites, two are Euro-American sites, and one site is listed as a faunal site which is likely prehistoric but could be Euro-American. The areas covered by these previous surveys appear to indicate that the study area for this proposed Project has a moderate to high potential for containing additional cultural resources.

Out of the 53 prehistoric sites, five have been recommended as eligible for the NRHP, 34 have been determined not eligible for the NRHP and the remaining 14 sites are considered unevaluated.

4.14.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no cultural resources impacts associated with the No Action Alternative.

4.14.2 Criteria for Determining Effect

A project results in an impact on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. All qualifying characteristics need to be considered, even those that may have been identified subsequent to the original evaluation of the property’s eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative as described in 36 CFR section 800.9(b) (1). For example, an adverse effect can result from the introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's historic features as described in 36 CFR section 800.9(b) (2), or result in isolation of the property from or alternation of the character of the property's setting when that character contributes to the property's qualifications for the NRHP. Adverse effects to cultural resources are minimized through application of the section 106 process.

Impacts to historic properties can be indirect such as increased human activity associated with construction related to the proposed Project. Constraints on construction zones and staging areas would mitigate potential disturbance of known and unknown cultural resources.

4.14.3 Proposed Project

White Site 1, Water Well Supply Site B, the White Site 1 Natural Gas Pipeline Route, White Site 1 transmission line corridor, and White Site 1 Water Pipeline were further evaluated for cultural resources through two pedestrian surveys. Representatives from the Sisseton, Lower Sioux, and Wahpekute tribes were present for the pedestrian surveys and they focused on identifying Traditional Cultural Properties (TCPs). No cultural resources were identified on White Site 1 or Water Well Supply Site B (Ferry and Peterson 2009). Sites investigated along the White Site 1 Natural Gas Pipeline Route were abandoned farmsteads and prehistoric artifact scatters. No NRHP-eligible sites were found on the property to be used for White Site 1, Water Well Supply Site B, the White Site 1 Natural Gas Pipeline or the White Site 1 transmission line (Thomas 2009).

Based on files research, no sites are known to exist on White Site 2, the White Site 2 Transmission Line, or Rural Water Pipeline Extension. However, six sites would be potentially impacted by the White Site 2 Natural Gas Pipeline Route. Should the White Site 2 Natural Gas Pipeline Route be selected, these sites would be evaluated for NRHP eligibility and further coordination with consulting parties would occur.

4.14.4 Cumulative Effects

The proposed Project would not affect any NRHP-eligible cultural resources and therefore would not have the potential to contribute to any past, present, or reasonably foreseeable future effects on cultural resources.

4.15 RECREATION

4.15.1 No Action

Under the No Action Alternative, Western would not approve an interconnection request with the Applicant and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the proposed Project would not be built and that the environmental impacts associated with construction and operation of the proposed Project would not occur. There would be no recreation impacts associated with the No Action Alternative.

4.15.2 Proposed Project

Impacts to recreational resources would be considered significant if:

- The proposed Project would directly impact acres normally used for recreational opportunities (i.e. WIAs, WPAs, or GPAs)
- The proposed Project would directly impact State parks or natural areas

4.15.2.1 White Site 1

The only recreational activity potentially affected is use of private lands in the area for activities such as hunting. Neighboring parcels of land might experience temporary effects in the movement or numbers of game species on these lands during construction of the facility, but it is expected that game species will return upon completion of facility construction. Game populations are not expected to be affected by the construction and operation of the facility. Construction and operation of White Site 1 will not affect recreational opportunities such as fishing or boating. Overhead transmission is already present to the west and south of the site, and a new line is not expected to significantly affect game species populations. Fishing, boating, and other recreational opportunities within the proposed Project area will be unaffected by the construction and operation of a new transmission line at White Site 1.

4.15.2.2 Water Well Supply Site B and Water Pipeline

Construction and operation of a water supply well and associated supply line on private land would potentially affect use of private lands for recreation such as hunting. Neighboring parcels of land might experience temporary effects in the movement or numbers of game species on these lands during construction of the facility, but it is expected that game species will return upon completion of facility construction. Game populations are not expected to be affected by the construction and operation of the facility.

4.15.2.3 White Site 2

The construction of a generation facility and overhead transmission line at White Site 2 would have similar impacts to recreation as White Site 1 and is not expected to affect recreational opportunities in the area. The on-site substation required for White Site 2 would have no impact on recreational opportunities in the proposed Project area. Fishing, boating, and other recreational opportunities within the proposed Project area will be unaffected by the construction and operation of the White Site 2 Transmission Line. Construction of the Rural Water Pipeline Extension would cause temporary disturbance to soil and vegetation in the immediate area. Some game species may temporarily leave the area during construction, but would be expected to return upon completion and reseeding.

4.15.2.4 White Site 1 Natural Gas Pipeline Route

There is one WIA along the White Site 1 Natural Gas Pipeline Route north of White Site 1. WIAs are primarily designed to give the public access to private land for hunting purposes. Construction of the preferred gas pipeline may temporarily impede access to the WIA since the pipeline would be constructed along the road. Operation of the preferred gas pipeline is not expected to permanently impact the WIA, or any game species populations living on or near this property. About half of the Natural Gas Pipeline Route would be parallel and adjacent to nearby roadways, and about half would be cross-country construction. Areas along local roadways have been previously disturbed, and impacts to recreational opportunities are not expected. In areas where the gas pipeline crosses open pastureland or cultivated cropland, only temporary impacts are expected during construction.

4.15.2.5 White Site 2 Natural Gas Pipeline Route

There are no WIAs or public lands along the White Site 2 Natural Gas Pipeline Route. Therefore, impacts to private properties would be similar to those with the White Site 1 Natural Gas Pipeline Route.

4.15.3 Cumulative Effects

There are no known past actions that have adversely affected recreation in the area. Reasonably foreseeable future actions that could affect recreation include the ongoing wind farm development in the area. None of these facilities are directly affecting recreation lands. The proposed Project, in conjunction with wind farm development, would not individually or cumulatively cause significant effects on recreation.

4.16 GLOBAL CHANGE IMPACTS ON THE REGION

Impacts of the proposed Project on GHG emissions are described in section 4.1. This section considers impacts of global change on the northern Great Plains region and the proposed Project itself. The Great Plains is characterized by strong seasonal climate variations. In the last few decades, average temperatures have increased throughout the region, with the largest changes occurring in the winter months and over the northern states. Relatively cold days are becoming less frequent and relatively hot days more frequent. Precipitation has also increased over much of the area.

In the future, the U.S. Global Change Research Program projects that temperatures will continue to increase. Summer changes are projected to be greater than those in winter. Conditions are anticipated to become wetter in the northern Great Plains, including more frequent heavy downpours resulting in more flooding, rising temperatures and more frequent heat waves, longer growing seasons, and shifts in vegetation hardiness zones. Ecosystem disruptions causing changes in habitat, water, and food supply would cause some species to decline, cause shifts in the range of native species, or encourage invasions of non-native species. Some species would be better adapted to a warmer climate. A warmer climate would affect air quality, and would generally mean more ground level O_3, causing more respiratory problems. Because of increased wetness, aquifers may be under less stress in the eastern South Dakota area than further to the south and west. Strong storms are projected to be more frequent in the northern Great Plains. Farming practices in the eastern South Dakota region will likely need to emphasize increasing the amount of crop residue left on the soil for erosion protection (USGCRP 2009). These future climate conditions may result in changes to the population and agricultural practices of eastern South Dakota, but are not likely to affect the operation of the Deer Creek Station, nor would these changes significantly affect the regional power demands which it is designed to serve.

4.17 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

NEPA requires that an EIS describe "any adverse environmental effects which cannot be avoided should the proposal be implemented." Unavoidable impacts are those that would remain after implementation of mitigation measures. Construction and operation of the proposed Project at White Site 1 would unavoidably convert 40 acres of land from agricultural uses to utility uses. Construction and operation of the proposed Project at White Site 2 would unavoidably convert 46 acres of land from agricultural uses to utility uses. This permanently converted acreage would represent an insignificant portion (much less than 1 percent) of the 418,115 acres of cropland in Brookings County. The introduction of a new industrial facility, along with transmission lines, would permanently change the visual landscape of the county. Wind farm construction in the area has already introduced visual contrast to the natural landscape, and the introduction of a power plant facility would likely be less noticeable because of the existing visual intrusions. Other unavoidable impacts would occur due to air emissions from natural gas combustion, and increased traffic from construction and operational personnel. As indicated in the air emission and transportation analyses, these impacts would be minor and would not significantly affect the environmental quality of the area. There would be unavoidable impacts from groundwater pumping should White Site 1 be chosen. However, indications are that this would be a productive well site subject to quick recharge from surrounding aquifers. Other environmental impacts of the proposed Project, such as water and natural gas pipeline construction, would produce impacts that are temporary in nature, and restoration of the natural landscape would occur following these temporary impacts. These relatively minor impacts to environmental resources would be offset by the societal benefit of a new source of electricity. It is not possible to quantify this benefit, as individuals would weigh the tradeoffs differently, and assign widely variable values to each resource.

4.18 SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

NEPA legislation requires that an EIS describe "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity." Short-term uses include the life span of the power plant and its associated facilities. As indicated in the discussion under the individual resources, the small footprint of the power plant and the limited emissions indicate that operation of the facility would not likely affect regional natural resources to any significant degree. However, the proposed Project would require short-term development of 40 or 46 acres of land, depending on the plant site, for the footprint of the power plant. Additional land would be needed for transmission lines, roadways, a water well site, and a natural gas pipeline for White Site 1; and transmission lines, roadways, a water pipeline, and a natural gas pipeline for White Site 2. Human communities would be positively affected by new jobs and income in the short term, and there would likely be few negative effects on public services or infrastructure.

Long-term uses refer to the time period following restoration and rehabilitation, during which the environment continues to be impacted. If the facility were re-used after its life as a power facility, development of the industrial facilities at the power plant footprint would be permanent, and topsoil would be lost at the building footprint and within the paved road footprint. If the facility was decommissioned and all facilities removed, natural resources in the vicinity, such as wildlife and groundwater, would be expected to recover quickly. It is unlikely that the natural resources or human communities in Brookings and Deuel Counties would be adversely affected in the long-term by the construction and operation of the proposed Project.

4.19 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA legislation requires that an EIS describe “any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.” Irreversible resource commitments involve damage to a resource that is not recoverable for use by future generations. The small size of the facility and its small emissions levels means that there would be minimal irreversible damage to regional natural resources. This would primarily involve the soil and agricultural property taken for the plant itself, and restoration after the life of the power plant would reduce these potential irreversible impacts. Irretrievable resource commitments are permanent losses of nonrenewable resources such as fossil fuels. Natural gas, energy, and non-recyclable materials used in construction and operation would represent irretrievable commitments of non-renewable resources that would not be available for use in other projects.

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5.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM NOTIFICATION OF AVAILABILITY OR COPIES OF THE DEIS WILL BE SENT

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U.S. Department of Agriculture Natural Resources Conservation Service	Diane Guidry	Washington	DC
U.S. Department of Agriculture Rural Utilities Service	Mark Plank	Washington	DC
U.S. Department of Transportation Federal Aviation Administration	Christopher Blum	Des Plaines	IL
U.S. Department of the Interior Environmental Policy and Compliance	Willie Taylor	Washington	DC
U.S. Environmental Protection Agency Region 8	Carol Rushin	Denver	CO
U.S. Environmental Protection Agency NEPA Program	Director	Denver	CO
U.S. Fish and Wildlife Service South Dakota Field Office	Pete Gober	Pierre	SD
U.S. Fish and Wildlife Service Brookings Wildlife Habitat Office	Kurt Forman	Brookings	SD
U.S. Fish and Wildlife Service Madison Wetland Management District	Manager	Madison	SD
U.S. Geological Survey Central Region	Stanley Ponce	Denver	CO
Federal Energy Regulatory Commission Office of Energy Projects	Mark Robinson	Washington	DC
Federal Highway Administration	John Rohlf	Pierre	SD
Federal Emergency Management Agency Denver Federal Center	Lanney Holmes	Denver	CO
Advisory Council on Historic Preservation	John Fowler	Washington	DC
United States Senate	John Thune	Washington	DC
United States Senate	Tim Johnson	Washington	DC
United States House of Representatives	Stephanie H. Sandlin	Washington	DC

Regional, State, and Local Government

Brookings County Board of County Commissioners	Don Larson	Brookings	SD
Deuel County Board of County Commissioners	Darold Hunt	Clear Lake	SD
Brookings County Highway Department	Larry Jensen	Brookings	SD
Brookings County Zoning and Drainage Department	Robert Hill	Brookings	SD
South Dakota Department of Agriculture	William Even	Pierre	SD
South Dakota Department of Environment and Natural Resources	Steven Pirner	Pierre	SD
South Dakota Department of Game, Fish and Parks	Doug Backlund	Pierre	SD
South Dakota Department of Transportation	Joel Jundt	Pierre	SD
South Dakota Public Utilities Commission	Patricia Van Gerpen	Pierre	SD
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South Dakota State Farm Service Agency	Steven Cutler	Huron	SD
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South Dakota House of Representatives	Sean O’Brien	Brookings	SD
South Dakota House of Representatives	Jim Peterson	Revillo	SD
South Dakota House of Representatives	Orville Smidt	Brookings	SD
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South Dakota Senate	Al Kurtenbach	Brookings	SD
City of Arlington	Amiel Redfish	Arlington	SD
City of Bruce	Jeff Anderson	Bruce	SD
City of Sinai	Brad Mitchell	Sinai	SD
City of Aurora	Fred Weeks	Aurora	SD
City of Bushnell	Josh Peterson	Bushnell	SD
City of Volga	Tom Pierce	Volga	SD
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Regional, State, and Local Government

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City of White	Randy Brown	White	SD
City of Clear Lake	Jayme Gross	Clear Lake	SD
City of Astoria	Terry Lovre	Astoria	SD

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Santee Sioux Tribe of Nebraska	Roger Trudell	Niobrara	NE
Sisseton-Wahpeton Oyate	Mike Selvage	Agency Village	SD
Spirit Lake Tribe	Myra Pearson	Fort Totten	ND
Upper Sioux Indian Community of Minnesota	Kevin Jensvold	Granite Falls	MN
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News Media and Libraries

Brookings Public Library	Elvita Landau	Brookings	SD
SDSU – Hilton M. Briggs Library	Susan Sutthill	Brookings	SD
Deubrook Community Library	Chris Christensen	White	SD
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8.0 INDEX

APPENDIX A – FINAL SCOPING REPORT SUMMARY

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FINAL SCOPING REPORT SUMMARY

Deer Creek Station
Environmental Impact Statement

Western Area Power Administration

May 2009

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TABLE OF CONTENTS

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1.0 INTRODUCTION

Basin Electric Power Cooperative (Basin Electric) is a generation and transmission cooperative headquartered in Bismarck, North Dakota. Basin Electric proposes to develop a new, 300-megawatt (MW) net intermediate natural gas combined-cycle generation facility located near the town of White in eastern South Dakota with an in-service date of mid-2012. Basin Electric's Power Supply Analysis (PSA) indicated that additional intermediate capacity will be needed in this timeframe to meet its members' growing energy demand. Based on the PSA, a 700-800 MW capacity deficit is projected in the eastern portion of Basin Electric's service area by the year 2014. Basin Electric is proposing to meet this increased demand by implementing a resource expansion plan that includes, in part, 250 MW of intermediate generation by 2012. The new generation facility has been identified as a means to meet the determined need for 250 MW of intermediate generation by 2012.

The proposed Deer Creek Station 300 MW generating project will be constructed on one of two sites. White Site 1 is located approximately 6 miles southeast of the town of White. A facility at this site would require approximately 14 miles of pipeline to supply natural gas from the Northern Border Pipeline. Approximately 1 mile of 345-kV single-circuit transmission line would be constructed to connect to the existing White Substation located adjacent to White Site 1. In addition, a groundwater supply well and connecting pipeline or connection to the Brookings-Deuel Rural Water Supply would be needed in association with the facility. White Site II is located approximately 4.5 miles northeast of the town of White. A facility at this site would require approximately 10 miles of natural gas supply pipeline from the Northern Border Pipeline. Approximately 0.5 mile of 345-kV double-circuit transmission line would be required, along with the construction of an on-site transmission substation. A generation facility at White Site II would require approximately 1 mile of pipeline to connect to the Brookings-Deuel Rural Water Supply.

The U.S. Department of Energy's Western Area Power Administration (Western) is serving as the lead agency for the environmental review process. Burns & McDonnell Engineering, Inc. was selected as Western's third-party environmental consultant for the project. The scoping process for the Deer Creek Station project began on February 6, 2009 when Western published a notice of intent (NOI) in the Federal Register to conduct a public scoping meeting and prepare an Environmental Impact Statement (EIS) for the project in accordance with the National Environmental Policy Act of 1969 (NEPA), DOE NEPA Implementing Procedures (10 CFR 1021), and the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR 1500-1508). In addition to the NOI, a letter was sent to representatives of agencies, tribes and interested parties to solicit input on the project and invite them to these meetings.

One public scoping meeting was held at the McKnight Community Center in White, South Dakota near the project area. Newspaper notices appeared in The Brookings Register and The Tri-City Star (White Edition). Radio advertisements were run on KWAT-AM (Watertown, SD) and KBRK-FM (Brookings, SD). This meeting was intended to fulfill Western's public scoping meeting requirements.

At the scoping meeting, representatives of Western, Basin Electric and Burns & McDonnell were available to discuss the project, the environmental review process, the project need and benefits, the proposed project location and to answer questions. There were 59 attendees at the scoping meeting. The period to receive written comments was open until April 7, 2009.

As a result of the scoping process, 14 comments were received from 12 agencies and two individuals.

* * * * *

2.0 AGENCY COORDINATION

2.1 AGENCY SCOPING LETTERS

Western sent agency coordination letters, dated February 13, 2009, to various local, state, and federal agencies as well as eight Native American Tribes. The letter provided a brief project description and information about the public scoping meeting as well as contact information for agency comments. A copy of the letter is included in Appendix A, along with a list of agencies that were contacted.

2.2 AGENCY COMMENTS

Agency letter responses were received from the following agencies:

FEDERAL
Advisory Council on Historic Preservation
U.S. Army, Corps of Engineers
U.S. Department of Transportation, Federal Aviation Administration
U.S. Department of Agriculture, Natural Resources Conservation Service
U.S. Department of Agriculture, Farm Service Agency
U.S. Department of Interior, Geological Survey
U.S. Department of Interior, Fish and Wildlife Service
U.S. Environmental Protection Agency

STATE
South Dakota Department of Environment & Natural Resources
South Dakota Department of Game, Fish & Parks

LOCAL
Brookings County Highway Department
Brookings County Sheriff’s Office

A summary of the comments received are included in Section 5.

* * * * *

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3.0 PUBLIC SCOPING

The public scoping process for the project involved the following components:

- notifying people about the public scoping meeting;
- conducting the public scoping meeting; and
- collecting / reviewing public comments.

Additional public involvement has consisted of informing the public through the project website – http://www.wapa.gov/transmission/deercreek.htm, personal communications, and newspaper articles regarding the project.

3.1 GOALS AND OBJECTIVES

The goals of the public scoping process were to provide information regarding the project to the public and solicit comments from the public. The objectives of Western and Basin were to establish a clear and open dialogue with the public and provide a process to identify and define the scope of issues to be addressed in the Draft EIS.

3.2 NOTIFICATION PROCESS

A Notice of Intent (NOI) to hold a public scoping meeting and prepare an Environmental Impact Statement was published by Western in the Federal Register on February 6, 2009 (Volume 74, Number 24, pp. 6284-6286).

A public scoping meeting was conducted on February 24, 2009 at the McKnight Community Center in White, South Dakota. The public was notified of this meeting by a series of advertisements in local newspapers, and spots on local radio stations. The following papers published the legal notice of the public scoping meeting:

- The Brookings Register, published on February 6, 13, and 20, 2009
- The Tri-City Star, published on February 12 and 19, 2009

3.3 PUBLIC SCOPING MEETING

The public scoping meeting was presented in an open house format, with a series of informative display stations regarding various aspects of the proposed project. Each station was staffed by Western, Basin Electric, or Burns & McDonnell representatives, who provided information about the project and answered questions. There were 59 members of the public that attended the scoping meeting (Appendix B). Public scoping meeting comment forms were available for the attendees to complete.

3.4 PUBLIC COMMENTS

Two public comments were received during the scoping comment period that ended April 7, 2009. Concerns noted in these comments included local traffic impacts from construction and operation of the project, dust issues from heavy traffic, impacts to air quality, and economic benefits to local communities.

* * * * *

4.0 SUMMARY OF AGENCY AND PUBLIC COMMENTS

Listed below is a listing of the agency and public scoping issues based on the comments received. The issues identified in the comments will be addressed in the Draft EIS.

Agency	Comments/Concerns
Federal	
Advisory Council on Historic Preservation	- Recommends that Western Area Power Administration initiate Section 106 process and consult with the SHPO, Native American tribes, and other concerned parties with regard to protection of historic properties.
U.S. Army Corps of Engineers	- Requests that should the proposed project affect navigation and/or involve either the discharge of dredged or fill material into waters subject to Federal regulation, the proposed EIS process should incorporate an alternatives analysis that is compliant with the Section 404 (Clean Water Act) Guidelines addressing impacts to waters of the U.S.. -Requests that an application form for the Section 404 permit be submitted along with drawings, maps, wetland delineations, color photos, and ecological or environmental information available that is pertinent to the project.
U.S. Environmental Protection Agency	- Requests reasonable alternatives to avoid impacts to wetlands, and avoidance of fen wetlands. - Requests evaluation of a least damaging practicable alternative (LEDPA) for wetland impacts. - Requests mitigation plan for unavoidable wetland impacts. - Recommends discussion and analysis of potential impacts to groundwater, surface water, drinking water, and irrigation waters. -Recommends all mitigation measures be analyzed in EIS to address impacts to ground, surface, drinking, and irrigation water. - Recommends analysis to potential impacts to floodplains. - Recommends evaluation of potential contribution to near-field and far-field air quality. - Requests consideration of greenhouse gas emissions (methane and carbon dioxide). - Requests evaluation of effects of project on area ecology, vegetation and wildlife, and hunting and fishing activities. - Requests the prevention of introducing and spreading of invasive plants and noxious weeds. - Recommends a detailed plan for addressing dust suppression, inspection schedules, and documentation and accountability processes. - Requests disclosure and evaluation of any environmental justice impacts. - Recommends cumulative impact analysis for resources of concern.
U.S. Department of	- Requests notification of construction or alterations as required by

Transportation, FAA	Federal Aviation Regulations, Part 77, Objects Affecting Navigable Airspace, Paragraph 77.13. - Requests contacting FAA Technical Operations to identify possible impacts to aircraft navigation and/or communication equipment. - Requests that the design, construction, and operation of the project does not create a hazardous wildlife attractant to surrounding airports. - Requests that Brookings Municipal Airport and White Airport be given opportunity to provide input and comments.
U.S.D.A. Natural Resources Conservation Service	- Confirmed that there are no easements administered by NRCS in the project area. - Requests the completion of the Farmland Conversion Impact Rating form (attached to letter) for White Site I and White Site II to determine impacts, if any, to prime farmland.
U.S.D.A. Farm Service Agency	- Have not been advised of any sites within the project area that have FSA mortgages or CRP tracts. - Has no specific comments at this time regarding the project.
U.S. Fish and Wildlife Service	- Requests confirmation of possible impacts to grassland and wetland easements from proposed natural gas pipeline. - Concerns over possible impacts to Western prairie fringed orchid, American burying beetle, and Topeka shiner (Federally protected species). Requests that if a determination of “may adversely affect” is made for any of these species by Western, a request for formal consultation would be made to USFWS. - Recommends reviewing guidelines for Bald Eagle Protection Act. - Requests ceasing construction in the event whooping cranes are sighted in the project area during spring and fall migration. - Recommends incorporating measures to prevent line strike and electrocution mortality for avian species (primarily migratory birds and raptors) from overhead transmission lines related to the project. - Encourages Basin Electric to investigate the formulation of an Avian Protection Plan if one is not already in place.
U.S. Geological Society	- Had a question about the availability and sustainability of the ground water supply in the area near the proposed well site, and the volume of water that would be required to support the project.
State	
S.D. Department of Environment and Natural Resources S.D. DENR (Continued)	- The Department does not anticipate adverse impacts to ground water quality by the project. - Suggests that additional research regarding past petroleum and chemical releases be conducted that could affect the project area. - Requests that, should contamination be encountered during construction activities, Basin Electric report this contamination to the Department. Contaminated soil will need to be stockpiled and sampled to determine disposal requirements. - Notes that the proposed gas pipeline route passes through the “B” Zone of Brookings County’s Well Head Protection Area, and the alternative pipeline route passes through the “A” Zone of Astoria’s water supply wells in several areas. Requests that Basin Electric consider this information when choosing the pipeline routes, and

	requests that the "A" zones be avoided, and minimize the amount of pipeline that crosses any "B" zones. - Requests that Basin Electric contact Brookings County Zoning Commission and the municipality of Astoria for information pertaining to the Well Head Protection Areas and zoning ordinances. - Requests that Basin Electric contact the Department's Water Rights Program if additional wells need to be drilled to provide water to operate the proposed facility.
S.D. Department of Game, Fish and Parks	- Concerns over possible existing wetlands on White Site I and II, according to existing National Wetlands Inventory maps. - Recommends avoidance of wetland impacts whenever possible. - Requests that if avoidance of wetlands is not possible, adverse impacts to wetlands would be minimized, and any lost acres would be replaced. - Requests minimizing impacts to fish and wildlife resources by complying with Section 404 of the Clean Water Act, using best-management practices during construction to minimize impacts to wetlands and soils, avoiding woodland habitat, and controlling noxious weeds. - Recommends contacting the Natural Heritage Program to determine locations of any rare, threatened, or endangered species in the proposed project area. - Requests that if any unanticipated threatened or endangered species be encountered during construction, all ground disturbing activities would cease in the immediate area until consultation with the appropriate agency could occur.
Local	
Brookings County Highway Department	- Concern with the operating status of county bridges within the project area, and the ability of Brookings County gravel road #36 to handle heavy loads associated with construction and operation of the project. - Concern with the use of county roads during the spring load limit posting.
Brookings County Sheriff's Department	- Brookings County Sheriff's Office would be a first responder for emergencies at the project area. - The project site would be put on the county's location for Homeland Security Patrol. - Concern with safety of workers due to weather during construction.
Citizen/Landowner	
Carlton and Janet Basmajian	- Personally welcome the project, but hope road access and impact to living conditions in the area will be considered. - Concern is with traffic access and flow to the White Site I, and associated dust from the gravel road impacting their residence.
Geoff Andrews Geoff Andrews	- Would like to know economic benefits to the communities of Toronto, Astoria, and White. - Would like to know the long-term outlook for wind energy in the

(Continued)	area. - Concern over the amount of air pollution generated by the proposed project.

*****

5.0 PROJECT STATUS AND COORDINATION

Western will prepare a Draft EIS that addresses the scoping issues identified by the agencies and public. The Draft EIS will be available for agency and public review and comment after which Western will prepare a Final EIS and Record of Decision (ROD). Notices announcing the availability of the EIS and ROD will be published in the Federal Register and in local newspapers.

If you have any questions or desire additional information, please feel free to contact the following:

Mr. Matt Marsh
NEPA Document Manager
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800
Fax: (406) 247-7408
Email: DeerCreekStationEIS@wapa.gov.

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APPENDIX A – AGENCY SCOPING LETTER AND MAILING LIST

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Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

February 13, 2009

The Mid America Bison Family
241 Galveston Ave.
Hot Springs, SD 57747

Dear Mid America Bison Family,

This letter requests information and your comments regarding a power generation facility construction project (Project) being proposed by Basin Electric Power Cooperative (Basin Electric) that is the subject of environmental review by Western Area Power Administration (Western). Western is one of four power marketing administrations within the U.S. Department of Energy (DOE) that has jurisdiction over transmission projects and operations.

Pursuant to the National Environmental Policy Act (NEPA), Western will prepare an environmental document that evaluates the potential environmental impacts of the proposed Project and the reasonable and feasible alternatives to the proposal. Basin Electric has submitted requests to interconnect the proposed Project to Western's transmission system. Interconnection would incorporate a new generation resource into Western's power transmission system, thereby requiring Western to prepare an Environmental Impact Statement (EIS) under DOE NEPA Implementing Procedures.

Description of the Proposed Project

Basin Electric is a regional wholesale electric generation and transmission cooperative owned and controlled by the member cooperatives it serves. Basin Electric includes 120 rural electric systems and is one of the largest electric generation and transmission cooperatives in the U.S. Basin Electric serves approximately 2.5 million customers in 430,000 square miles covering portions of nine states: Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota, and Wyoming.

Basin Electric proposes to construct and own a 300-megawatt (MW) net intermediate natural gas combustion turbine generation facility and associated energy transmission facilities in eastern Brookings County, South Dakota (see Figure 1 attached). In addition to the generation facility, the proposed Project would include ancillary facilities such as a natural gas pipeline for fuel delivery, transmission facilities, water well system or delivery system from existing rural water system, wastewater processing, and construction of access roads. The purpose of the proposed Project is to construct a natural gas combined-cycle intermediate generation facility to help serve the increased demand for electrical power to member cooperatives in the eastern portion of Basin Electric's nine-state service area, and to connect this generation facility to Western's transmission grid.

Agency Consultation

At this time, on behalf of Western, I would like to request your comments or concerns regarding the proposed Project. Any information you can provide relating to the following issues will assist Western in its determination of what environmental issues should be addressed in the EIS:

- Local land use
- Transportation
- Air emissions and ambient air quality
- Energy use
- Water quality and wetlands
- Ambient noise levels
- Historic sites, archaeological sites, or cultural resources
- Native American tribal issues or concerns
- Socioeconomics (population, employment, growth, and development)
- Wildlife, vegetation, and fisheries
- Soils and geology

Information on any additional issues or concerns that you consider appropriate would also be appreciated. We request your response by April 7, 2009, so that we may be able to schedule any meetings, site visits, or surveys, conduct any necessary follow-up activities, and incorporate your response into the scope of the study, as appropriate.

If you have any questions, please do not hesitate to contact me at 406-247-7385. Thank you for your assistance.

Sincerely,

Matt Marsh

Matt Marsh
Environment-Project Manager
Upper Great Plains

Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

February 19, 2009

The Mid America Bison Family
241 Galveston Ave.
Hot Springs, SD 57747

Dear Sir or Madam,

You should have recently received a letter soliciting your comments or concerns with Basin Electric Power Cooperative's Deer Creek Station Project proposal (300 MW gas turbine electric generation project) near White, SD. This is a follow-up letter to send Figure 1 detailing the location of the proposed project. I inadvertently left the figure out of the mailing. I am sorry for any confusion this may have caused you.

If you have any questions, please do not hesitate to contact me at 406-247-7385 or mmarsh@wapa.gov . Thank you for your assistance.

Sincerely,

Matt Marsh

Matt Marsh
Environment-Project Manager
Upper Great Plains

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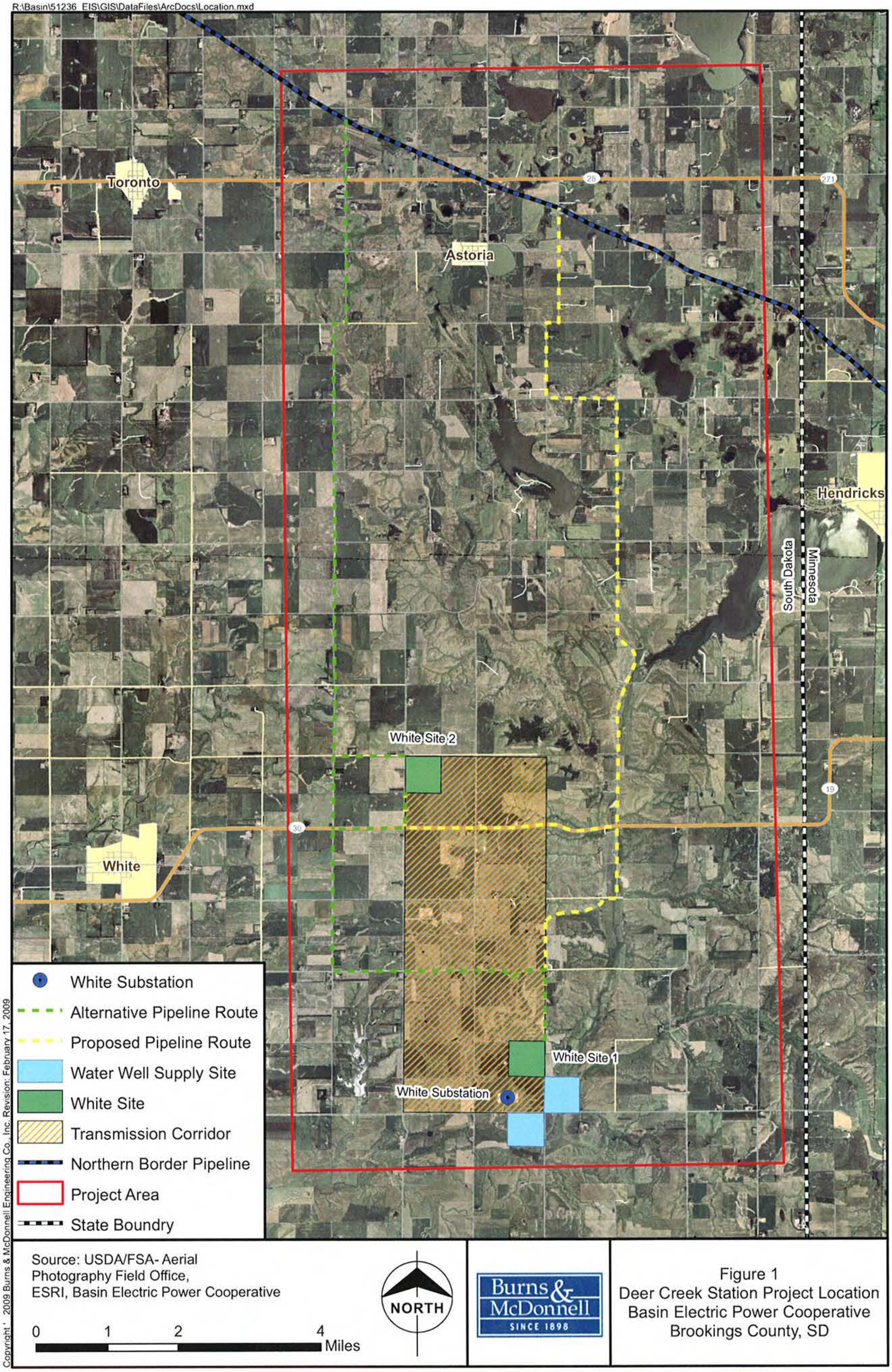

Source: USDA/FSA- Aerial Photography Field Office, ESRI, Basin Electric Power Cooperative

Burns & McDonnell SINCE 1898

Figure 1
Deer Creek Station Project Location
Basin Electric Power Cooperative
Brookings County, SD

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«First Name»	«Last Name»	«Job Title»	«Company/agency»	«Address 1»	«Address 2»	«City»	«State»	«Zip»
Jon	Christensen	Colonel	U.S. Army Corps of Engineers	St. Paul District	190 5th Street East, Suite 401	St. Paul	MN	55101-1638
Carol	Rushin	Acting Regional Administrator	U.S. Environmental Protection Agency, Region 8		1595 Wynkoop St., 8EPR-N Mail Code	Denver	CO	80202-1129
		Director	U.S. Environmental Protection Agency	NEPA Program	1595 Wynkoop St., 8EPR-N Mail Code	Denver	CO	80202-1129
Mr. Pete	Gober	Supervisor	U.S. Fish & Wildlife Service	South Dakota Field Office	420 S. Garfield Avenue, Suite 400	Pierre	SD	57501-5408
Mr. Kurt	Forman	Project Leader	U.S. Fish & Wildlife Service	Brookings Wildlife Habitat Office	P.O. Box 247	Brookings	SD	57006
		Manager	U.S. Fish & Wildlife Service	Madison Wetland Management District	P.O. Box 48	Madison	SD	57042
Ms. Patricia	Klintberg	Director, External Affairs	U.S. Department of Agriculture	Farm Service Agency-Public Affairs Staff	1400 Independence Ave., SW STOP 0506	Washington	DC	20250-0506
Mr. Mark	Robinson	Director	Federal Energy Regulatory Commission	Office of Energy Projects	888 First Street, NE	Washington	DC	20426
Mr. John	Fowler	Executive Director	Advisory Council on Historic Preservation	Old Post Office Building, Suite 803	1100 Pennsylvania Avenue, NW	Washington	DC	20004
Ms. Dianne	Guidry	Director, Public Affairs	U.S. Department of Agriculture	Natural Resources Conservation Service	Room 6121-S, P.O. Box 2890	Washington	DC	20013
		Environmenta & Historic Preservation	Federal Emergency Management Agency	Denver Federal Center	Building 710, Box 25267	Denver	CO	80225-0267
Mr. Mark	Plank	Director	U.S. Department of Agriculture-Rural Utilities Service	Engineering and Environmental Staff	Room 2242-S, Mail Stop 1571, 1400 Independence Ave, SW	Washington	DC	20250
Mr. Barry	Cooper	Regional Administrator	U.S. Department of Transportation	Federal Aviation Administration-Great Lakes Region	O'Hare Lake Office Center, 2300 East Devon Avenue	Des Plaines	IL	60018
Mr. Willie	Taylor	Director	U.S. Department of the Interior	Office of Environmental Policy and Compliance	1849 C. Street, NW, MS 2342	Washington	DC	20240
Mr. Stanley	Ponce	Central Regional Director	U.S. Geological Survey	Central Region	Denver Federal Center, Building 810, Mail Stop 150	Denver	CO	80225-0046
Ms. Deanna	Santema	Chairperson	Brookings County Board of County Commissioners		1621 Robin Road	Brookings	SD	57006
Mr. Larry	Jensen	Superintendent	Brookings County Highway Department		422 Western Avenue	Brookings	SD	57006
Mr. Robert	Hill	Director of Planning, Zoning, & Drainage	Brookings County Zoning and Drainage Department		1921 Building, 601 4th Street, Suite 105	Brookings	SD	57006
Mr. William	Even		South Dakota Department of Agriculture	Office of the Secretary	523 E. Capitol Avenue	Pierre	SD	57501-3182
Mr. Steven	Pirner	Secretary	South Dakota Department of Environment and Natural Resources		Joe Foss Building, 523 E. Capitol	Pierre	SD	57501
Mr. Jeff	Vonk	Secretary	South Dakota Department of Game, Fish and Parks		523 E. Capitol Avenue	Pierre	SD	57501
Mr. Joel	Jundt	Director, Division of Planning	South Dakota Department of Transportation	Becker-Hansen Building	700 E. Broadway Ave.	Pierre	SD	57501
Ms. Patricia	Van Gerpen	Executive Director	South Dakota Public Utilities Commission	Capitol Building, 1st Floor	500 E. Capitol Avenue	Pierre	SD	57501-5070
Ms. Paige	Hoskinson Olson	Review & Compliance Coordinator	South Dakota State Historic Society	State Historic Preservation Office	900 Governors Drive	Pierre	SD	57501-2217
Mr. Josh	Weston	Chairman	Flandreau Santee Sioux		P.O. Box 283	Flandreau	SD	57028-0283
Jean	Stacy	President	Lower Sioux Indian Community of Minnesota		P.O. Box 308, 39458 Res. Highway 1	Morton	MN	56270
Marlys	Opsahl	Tribal Council Administrative Assistant	Prairie Island Indian Community of Minnesota		5636 Sturgeon Lake Road	Welch	MN	55089
Mr. Roger	Trudell	Tribal Chairman	Santee Sioux Tribe of Nebraska		425 Frazier Ave. North, Suite 2	Niobrara	NE	68760
Mr. Mike	Selvage	Chairman	Sisseton-Wahpeton Oyate		P.O. Box 509	Agency Village	SD	57262-0509
Myra	Pearson	Tribal Chairperson	Spirit Lake Tribe		P.O. Box 359	Fort Totten	ND	58335
Mr. Kevin	Jensvold	Chairman	Upper Sioux Indian Community of Minnesota		P.O. Box 147	Granite Falls	MN	56241

Mr. Robert	Cournoyer	Chairman	Yankton Sioux Tribe		P.O. Box 248	Marty	SD	57361
Mr. Mike	Rounds	Governor	Office of the Governor		500 E. Capitol Avenue	Pierre	SD	57501
Mr. Robert F.	Stewart	Regional Environmental Officer	U.S. Department of the Interior	Denver Federal Center	P.O. Box 25007 (D-108)	Denver	CO	80225-0007
Mr. John	Rohlf	Division Administrator	Federal Highway Administration		116 East Dakota, Suite A	Pierre	SD	57501
Steve	Naylor	State Regulatory Program Manager	U.S. Army Corps of Engineers	28563 Powerhouse Rd., Room 118	Pierre Regulatory Office	Pierre	SD	57501-6174
Christopher	Blum	Regional Administrator	Federal Aviation Administration	2300 East Devon Avenue	O'Hare Lake Office Center	Des Plaines	IL	60018
Janet	Oertly	State Conservationist	Natural Resources Conservation Service	Federal Building, Room 203, 200 4th St. SW	South Dakota State Office	Huron	SD	57350-2475
Steven	Cutler	State Executive Director	South Dakota State Farm Service Agency	200 4th St. SW		Huron	SD	57350-2431
Billy Joe	Waara		Governor's Office of Economic Development	711 E. Wells Avenue		Pierre	SD	57501-3369
Amiel	Redfish	Mayor	City of Arlington	202 West Elm Street		Arlington	SD	57212
Jeff	Anderson	Mayor	City of Bruce	Box 255		Bruce	SD	57220
Brad	Mitchell	Mayor	City of Sinai	Box 86		Sinai	SD	57061
Fred	Weeks	Mayor	City of Aurora	Box 335		Aurora	SD	57002
Josh	Peterson	Mayor	City of Bushnell	21081 1st Avenue South		Bushnell	SD	57276
Tom	Pierce	Mayor	City of Volga	Box 217		Volga	SD	57071
Scott	Munsterman	Mayor	City of Brookings	311 3rd Avenue		Brookings	SD	57006
Doug	Freidel	Mayor	City of Elkton	Box 308		Elkton	SD	57026
Gary	Emmett	Mayor	City of White	Box 682		White	SD	57276
Jayme	Gross	Mayor	City of Clear Lake	125 Third Avenue South		Clear Lake	SD	57226
Don	Larson	Chairperson	Brookings County Commission	2533 54th St. SW		Brookings	SD	57006
Dennis	Falken	Vice-Chairperson	Brookings County Commission	1632 Overlook Ridge Road		Brookings	SD	57006
Deanna	Santema	Commissioner	Brookings County Commission	1621 Robin Road		Brookings	SD	57006
Alan	Gregg	Commissioner	Brookings County Commission	224 Front Street		Brookings	SD	57006
Mary	Negstad	Commissioner	Brookings County Commission	625 Oak Avenue		Volga	SD	57071
Darold	Hunt	Commissioner	Deuel County Commission	P.O. Box 616	408 4th St. West	Clear Lake	SD	57226
Gordon	Anderson	Commissioner	Deuel County Commission	P.O. Box 616	408 4th St. West	Clear Lake	SD	57226
Gary	Jaeger	Commissioner	Deuel County Commission	P.O. Box 616	408 4th St. West	Clear Lake	SD	57226
Don	Hanson	Commissioner	Deuel County Commission	P.O. Box 616	408 4th St. West	Clear Lake	SD	57226
Ray	Van Liere	Commissioner	Deuel County Commission	P.O. Box 616	408 4th St. West	Clear Lake	SD	57226
John	Thune	U.S. Senator	United States Senate	383 Russell Senate Office Building		Washington	D.C.	20510
Tim	Johnson	U.S. Senator	United States Senate	136 Hart Senate Office Building		Washington	D.C.	20510
Stephanie	Herseth Sandlin	U.S. Representative	United States House of Representatives	331 Cannon House Office Building		Washington	D.C.	20515
Tim	Begalka	State Representative-District 4	South Dakota House of Representatives	18254 SD Hwy 15		Clear Lake	SD	57226-5401
Sean	O'Brien	State Representative-District 7	South Dakota House of Representatives	P.O. Box 421		Brookings	SD	57006-0421
Jim	Peterson	State Representative-District 4	South Dakota House of Representatives	16952 482nd Ave		Revillo	SD	57259-5208
Orville	Smidt	State Representative-District 7	South Dakota House of Representatives	117 Fourth St.		Brookings	SD	57006-1915
Arnold	Brown	State Senator-District 7	South Dakota Senate	1718 Teton Pass		Brookings	SD	57006-3626
Al	Kurtenbach	State Senator-District 4	South Dakota Senate	47209 220th Street		Brookings	SD	57006-7112
Bob	Paulson	Program Director	The Nature Conservancy	Black Hills Area Ecoregion	8100 Sheridan Lake Road	Rapid City	SD	57702
Patrick	Anderson	Executive Director	Northern Prairies Land Trust	401 E. 8th Street, #200B		Sioux Falls	SD	57103
Jim	Margadant	Chairperson	South Dakota Chapter of the Sierra Club	P.O. Box 1624		Rapid City	SD	57709-1624
Dave	Johnson	President	Missouri Breaks Audubon Society	P.O. Box 832		Pierre	SD	57501
Jeffrey	Nelson	Director of Operations	Ducks Unlimited	Great Plains Regional Office	2525 River Road	Bismarck	ND	58593-9011
			South Dakota Clean Water Action	405 South 3rd Ave., Suite 102A		Sioux Falls	SD	57104
Mike	Williams	Division President	Izaak Walton League of America	South Dakota Division	Stoney Point 728 S. Lake Drive	Watertown	SD	57201

			Pheasants Forever, Inc.	1783 Buerkle Circle		St. Paul	MN	55110
Catherine	Twitero	President	Brookings School District 05-1	2130 - 8th St. South		Brookings	SD	57006
Tim	Bauer	President	Elkton School District 05-3	P. O. Box 190		Elkton	SD	27026-0190
Darold	Hunt	Chairman	Deuel County Commission	P. O. Box 616		Clear Lake	SD	57226-0616
Dave	Huebner	Board President	City of Bushnell	21081 - 1st Ave. South		Bushnell	SD	57276
Randall	Brown	Mayor	City of White	P. O. Box 682		White	SD	57276-0682
Bert	Rogness	President	Deubrook School District 05-6	P. O. Box 346		White	SD	57276-0346
Terry	Lovre	Mayor	City of Astoria	P. O. Box 8		Astoria	SD	57213-0008
David	Landsman	Mayor	City of Elkton	P. O. Box 308		Elkton	SD	57026-0308
Michael	Wilson	Airport Manager	Brookings Municipal Airport	509 W. 2nd St. S.		Brookings	SD	57006

APPENDIX B – WETLAND DELINEATION MAPS

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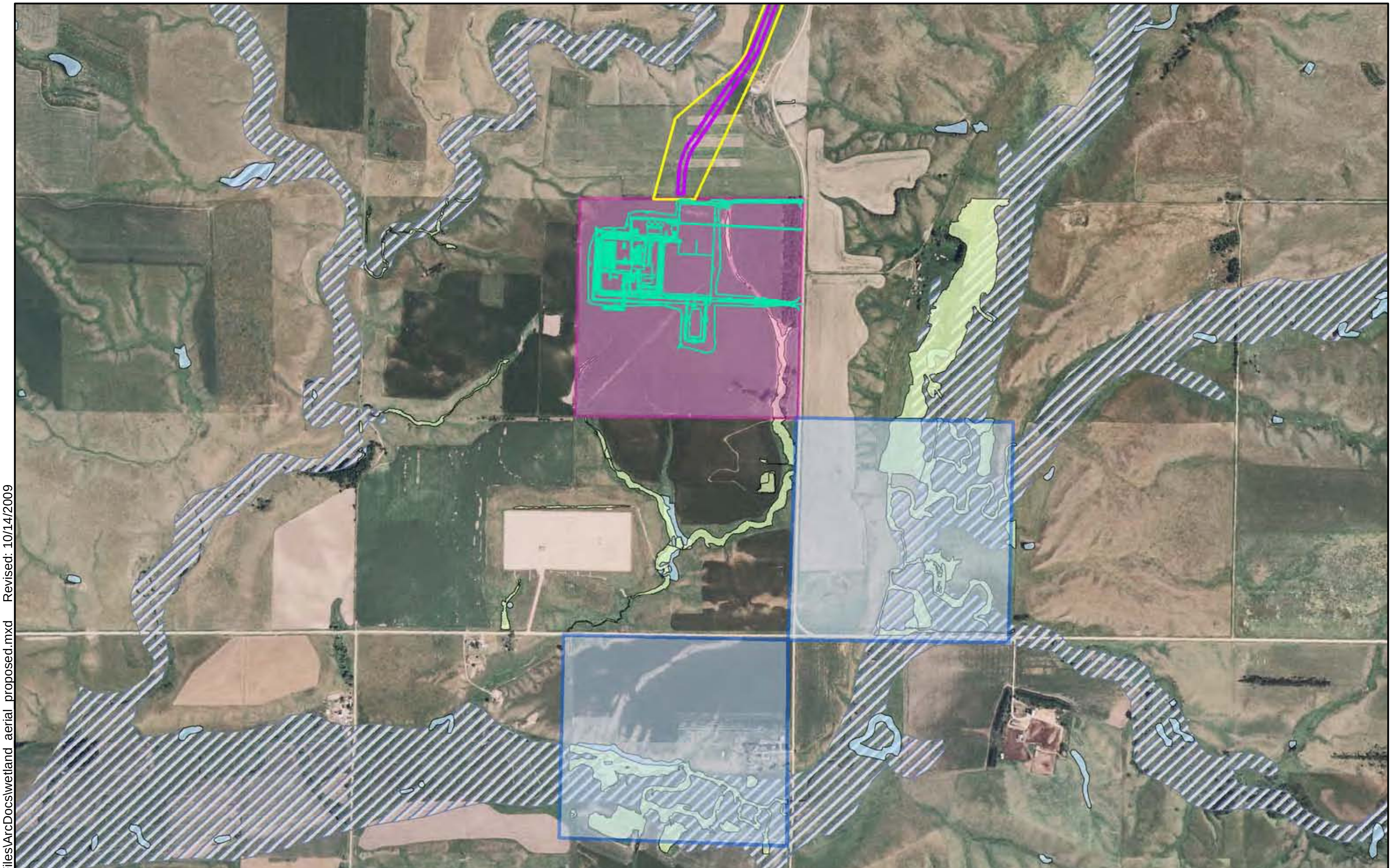

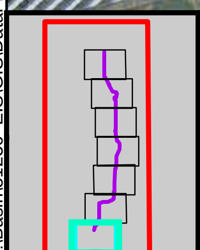

Legend

- White Site 1 Boundaries
- White Site 1 Plant Layout
- White Site 1 Natural Gas Pipeline Route 75' Corridor
- White Site 1 Natural Gas Pipeline Route 200' Corridor
- H2O Well Sites A and B
- Delineated Wetlands
- NWI Wetlands
- FEMA Floodplains

0 500 1,000 2,000 Feet

NORTH

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 1 Project
Figure A

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

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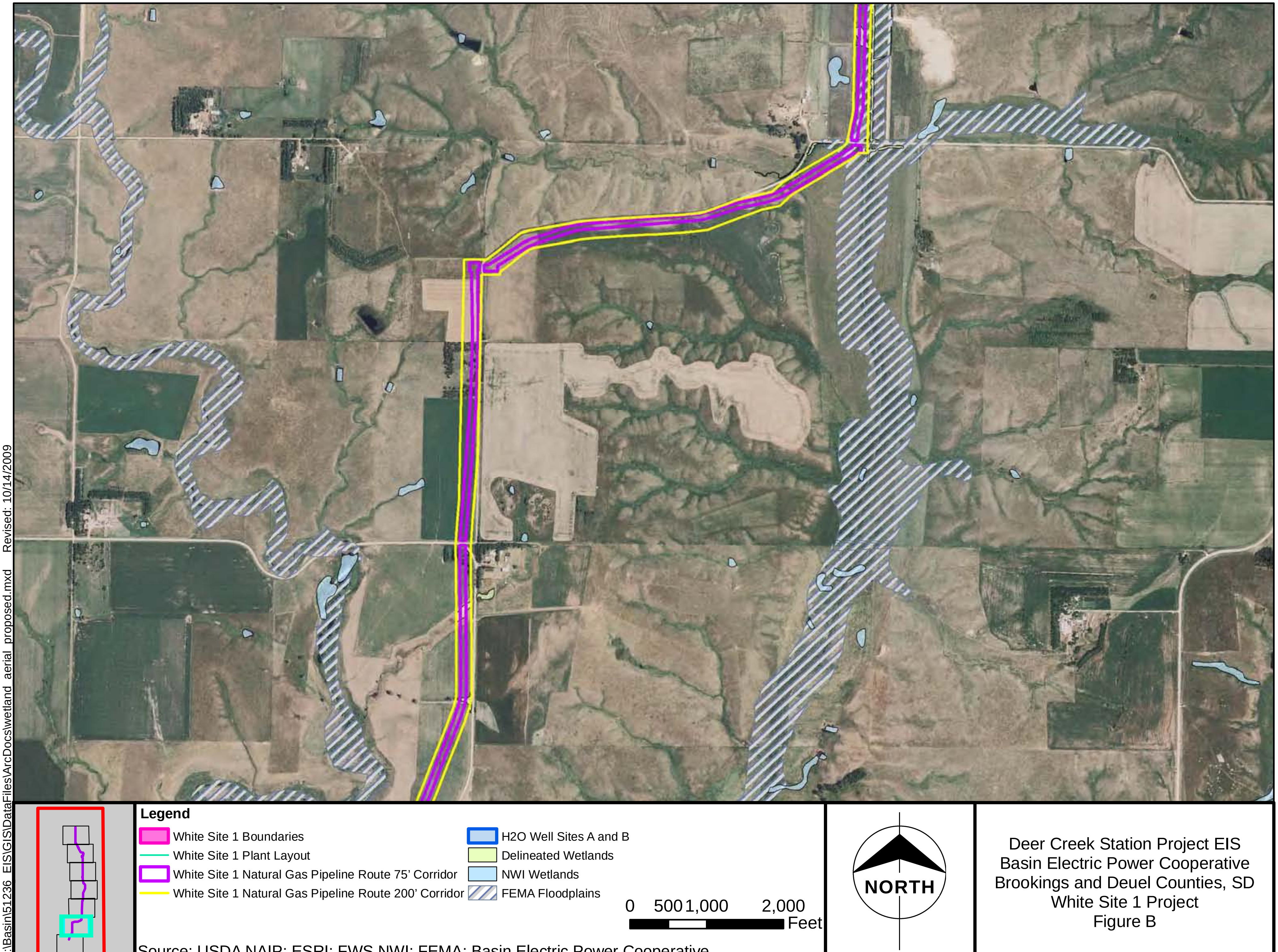

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 1 Project
Figure B

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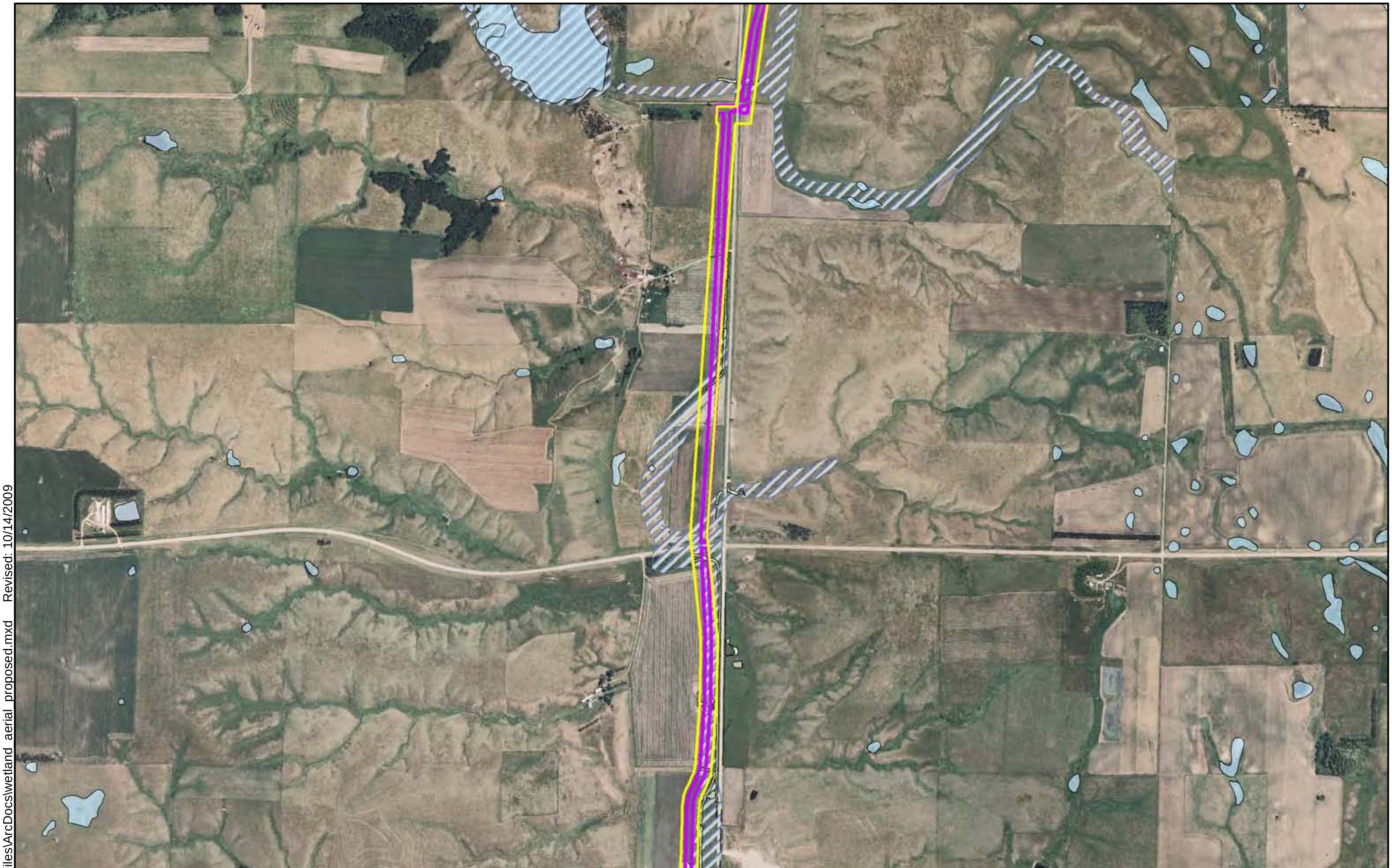

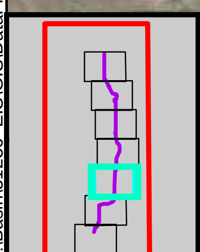

Legend

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0 500 1,000 2,000 Feet

NORTH

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 1 Project
Figure C

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

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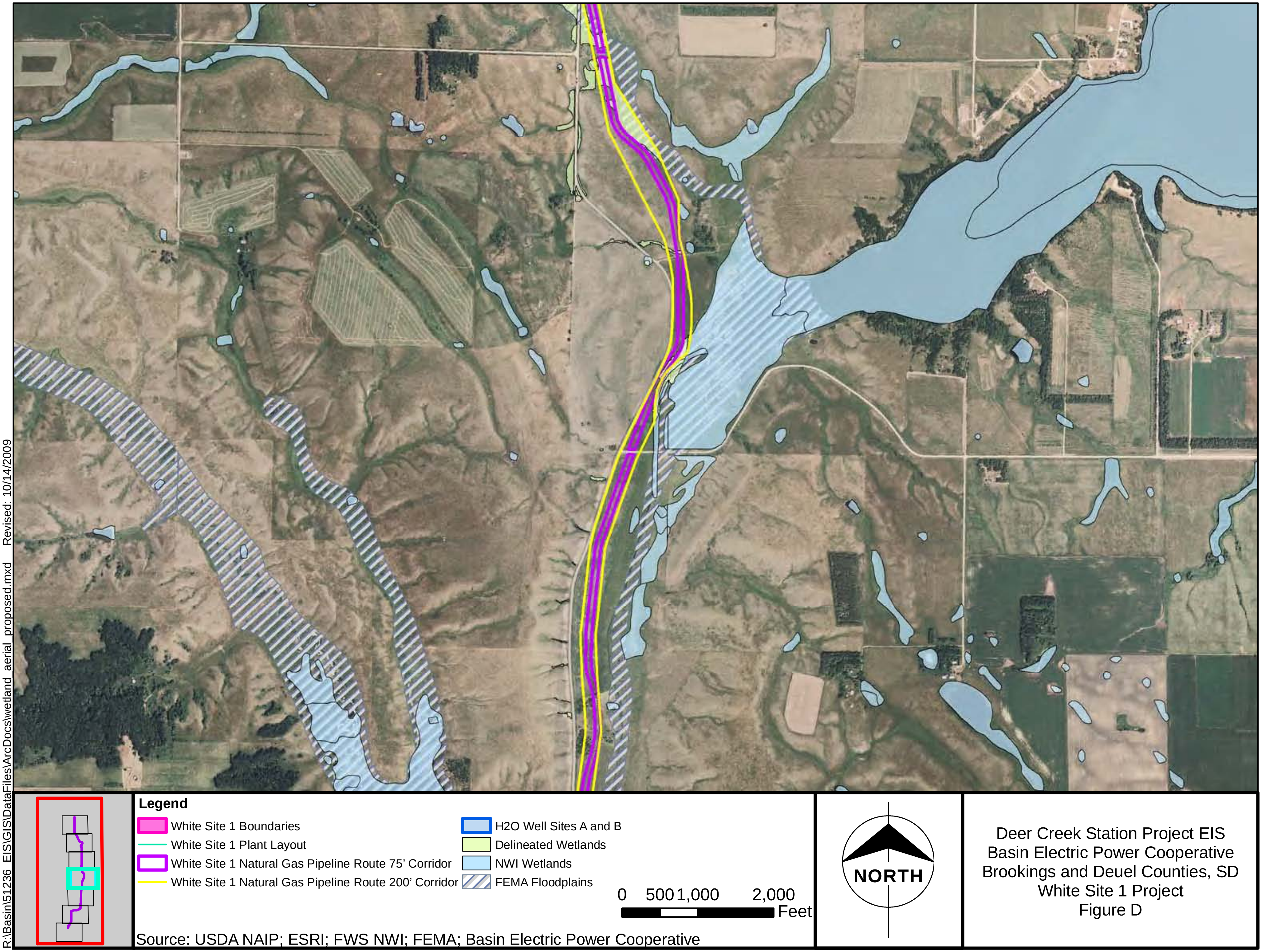

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 1 Project
Figure D

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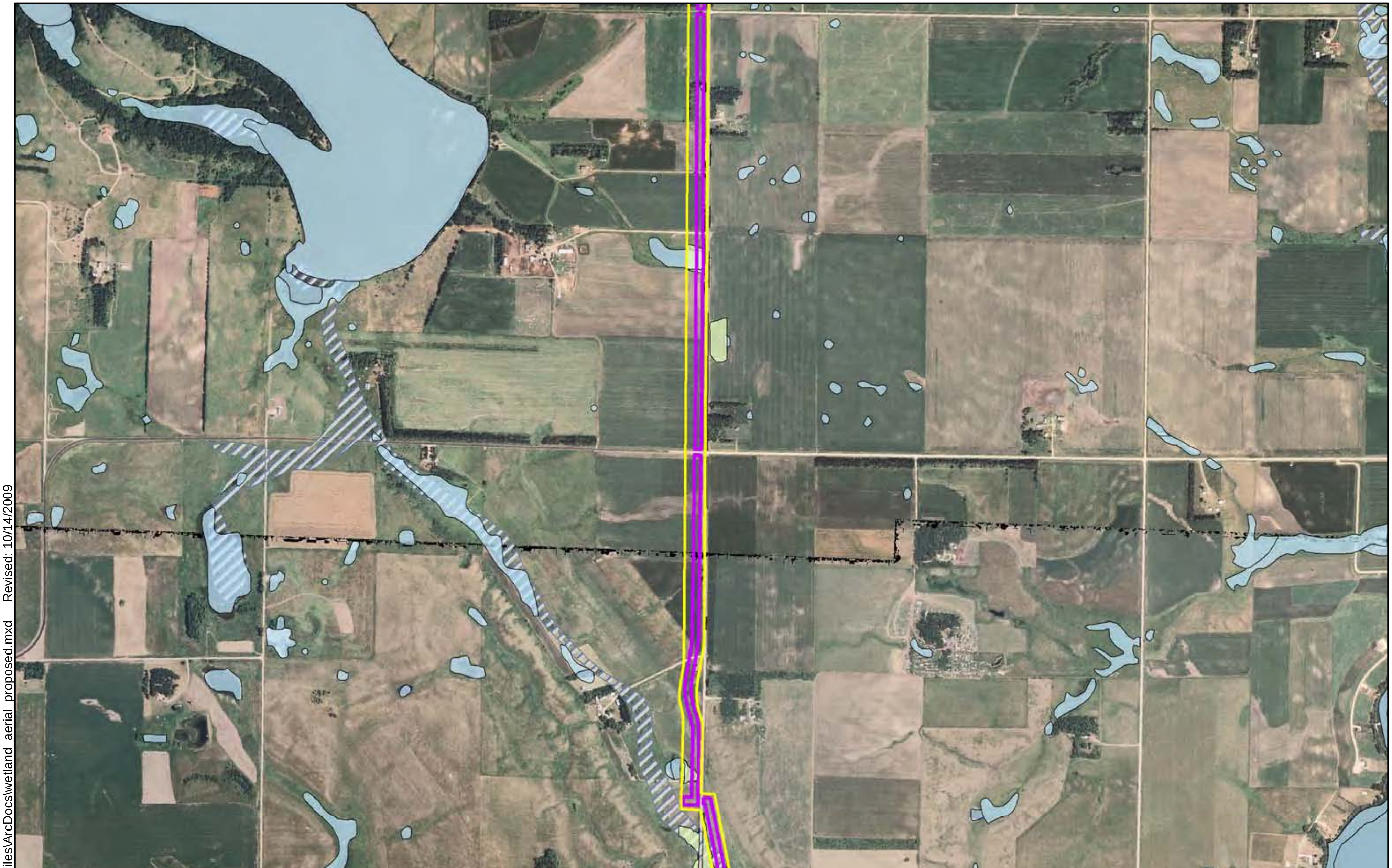

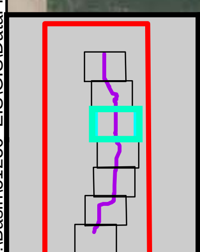

Legend

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0 500 1,000 2,000 Feet

NORTH

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 1 Project
Figure E

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

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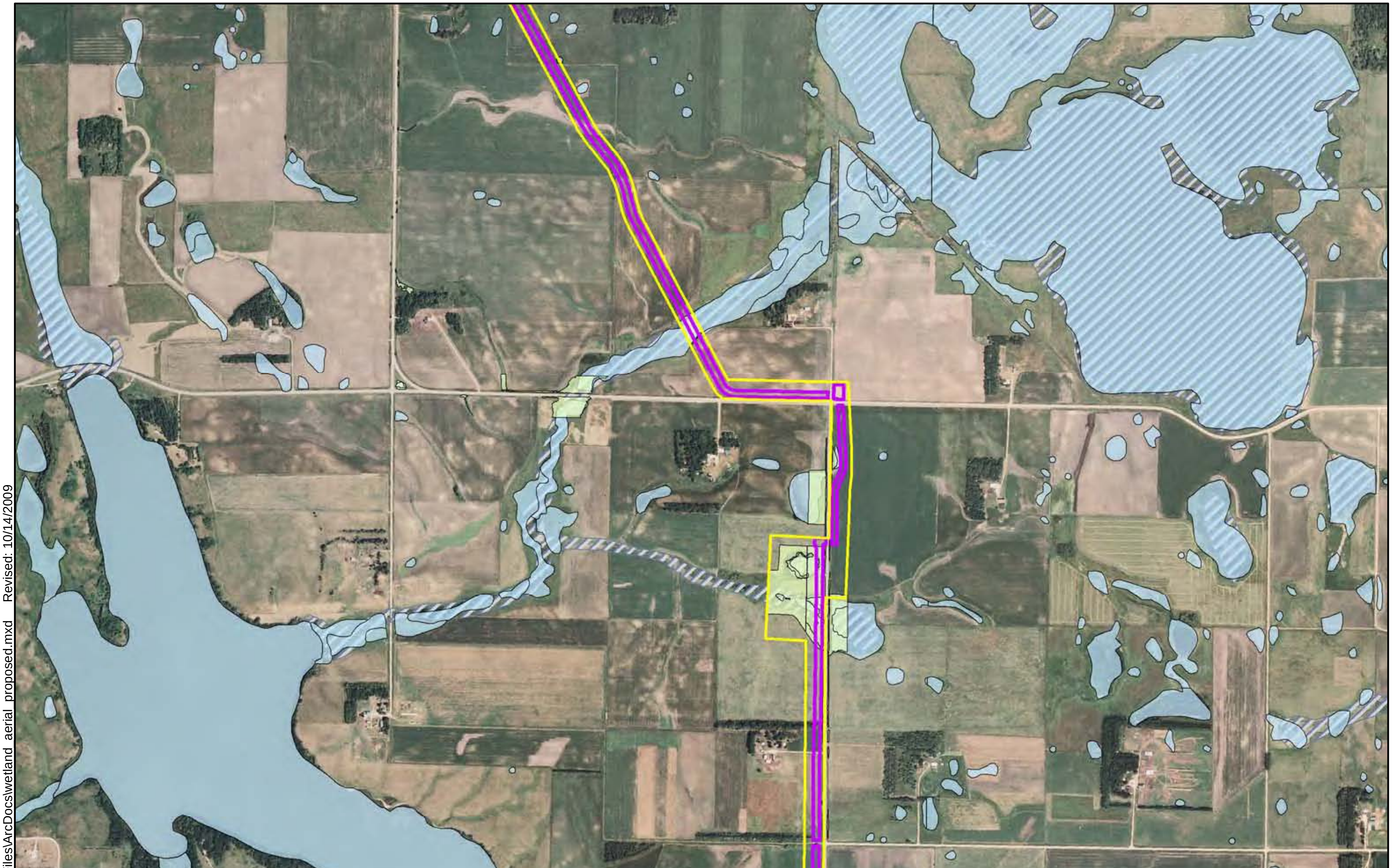

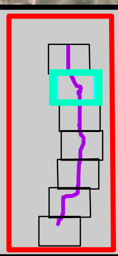

Legend

White Site 1 Boundaries
White Site 1 Plant Layout
White Site 1 Natural Gas Pipeline Route 75' Corridor
White Site 1 Natural Gas Pipeline Route 200' Corridor
H2O Well Sites A and B
Delineated Wetlands
NWI Wetlands
FEMA Floodplains

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

0 500 1,000 2,000 Feet

NORTH

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 1 Project
Figure F

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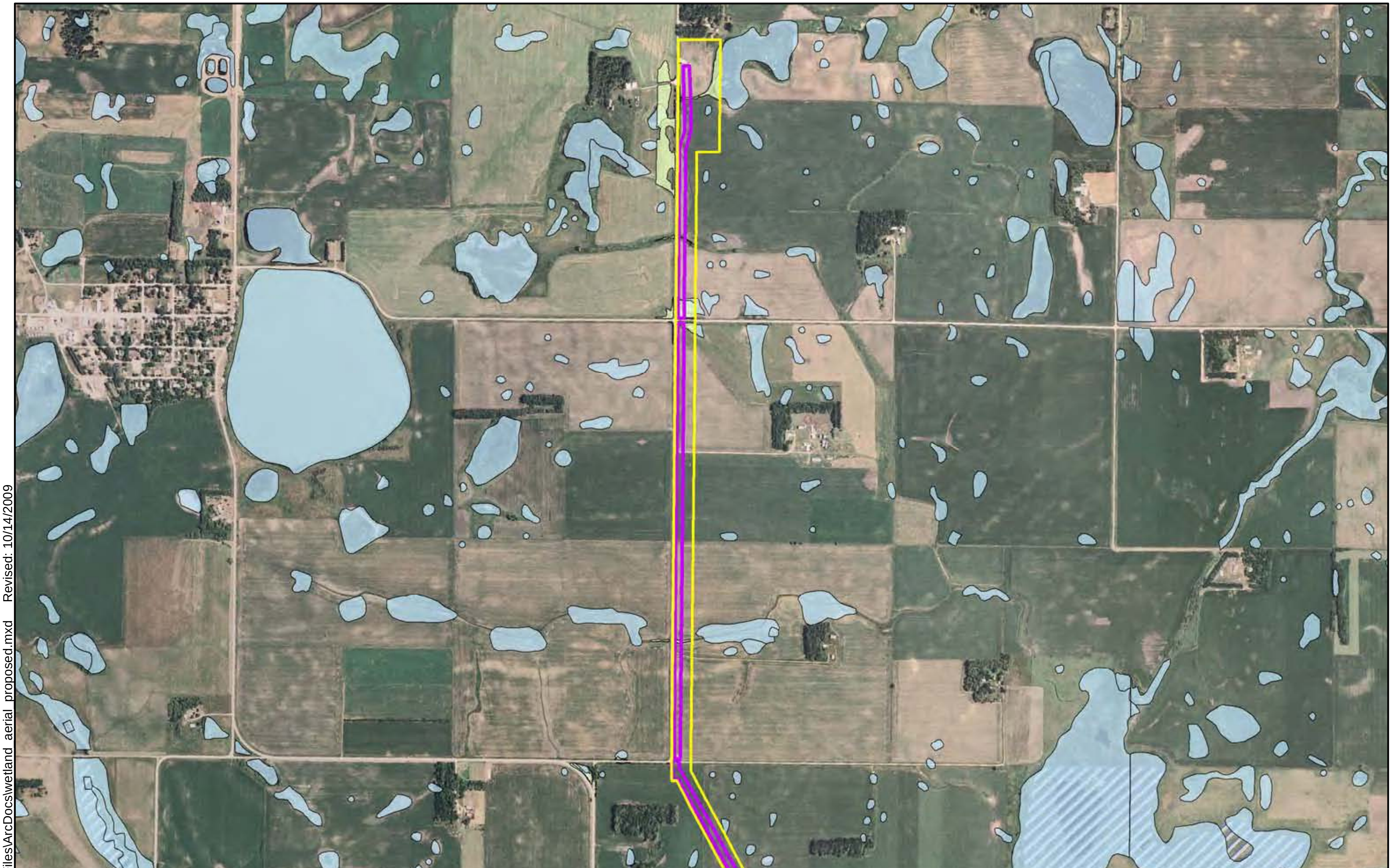

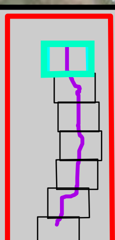

Legend

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- NWI Wetlands
- FEMA Floodplains

0 500 1,000 2,000
Feet

NORTH

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 1 Project
Figure G

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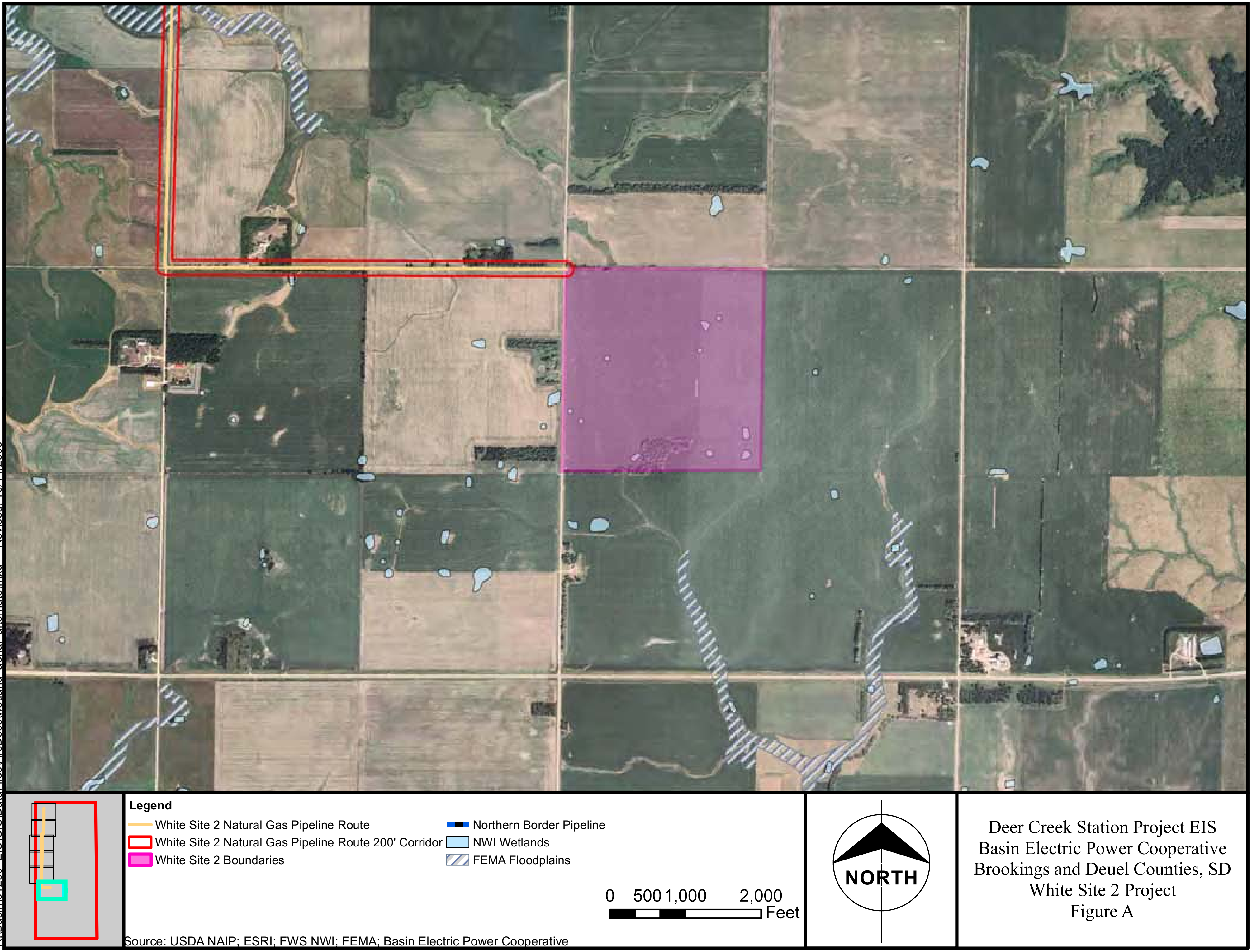

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 2 Project
Figure A

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

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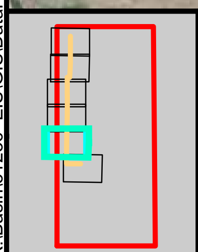

Legend

- White Site 2 Natural Gas Pipeline Route
- White Site 2 Natural Gas Pipeline Route 200' Corridor
- White Site 2 Boundaries
- Northern Border Pipeline
- NWI Wetlands
- FEMA Floodplains

0 500 1,000 2,000 Feet

NORTH

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 2 Project
Figure B

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

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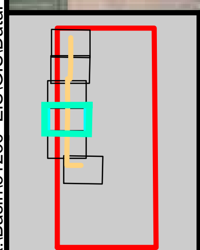

Legend

White Site 2 Natural Gas Pipeline Route

White Site 2 Natural Gas Pipeline Route 200' Corridor

White Site 2 Boundaries

Northern Border Pipeline

NWI Wetlands

FEMA Floodplains

0 500 1,000 2,000 Feet

NORTH

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 2 Project
Figure C

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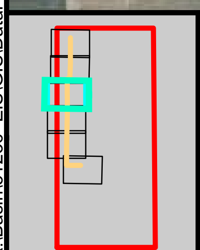

Legend

- White Site 2 Natural Gas Pipeline Route
- White Site 2 Natural Gas Pipeline Route 200' Corridor
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- NWI Wetlands
- FEMA Floodplains

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 2 Project
Figure D

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

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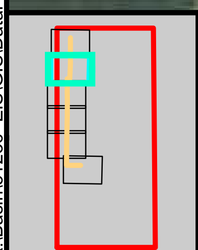

Legend

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0 500 1,000 2,000 Feet

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

NORTH

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 2 Project
Figure E

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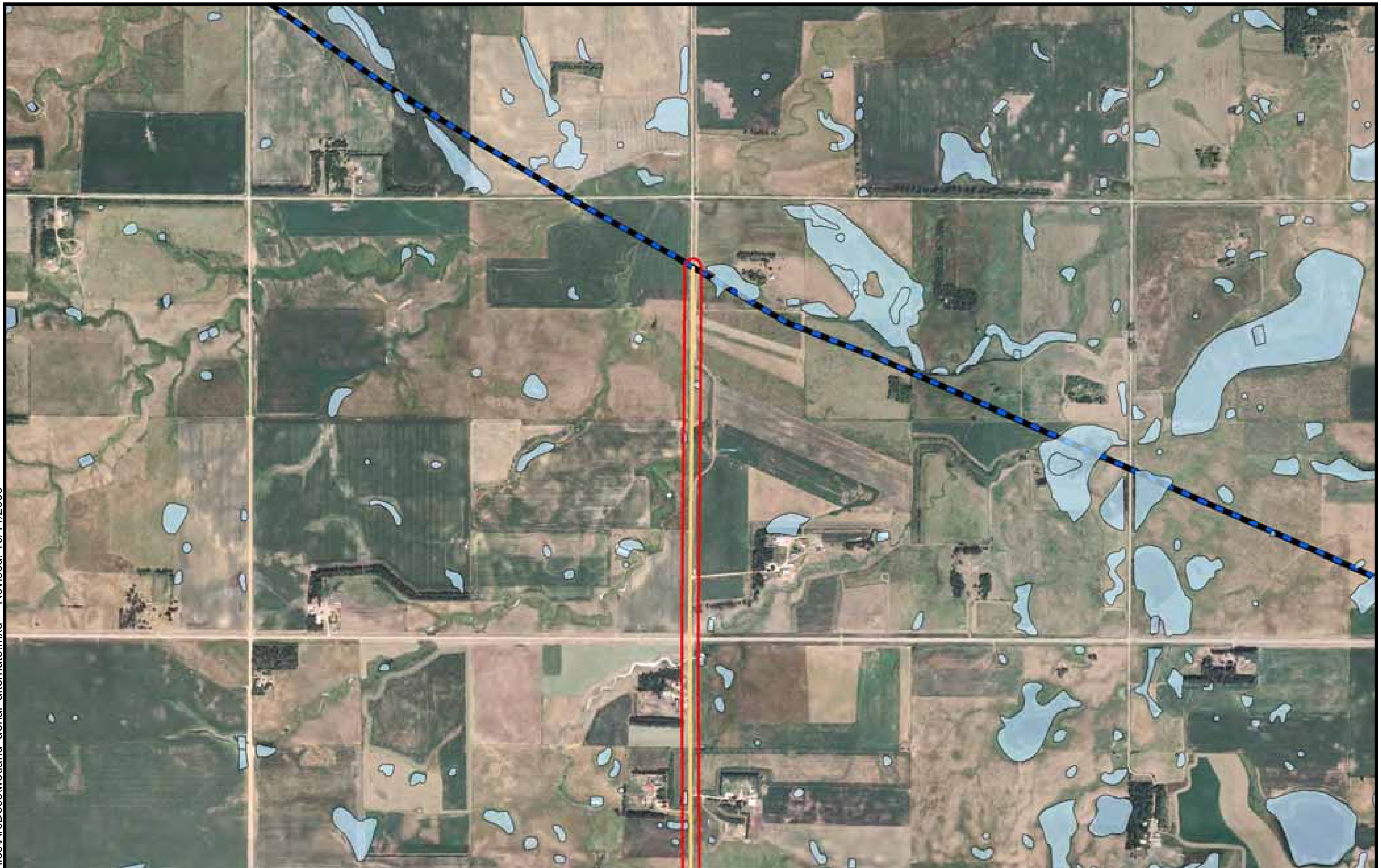

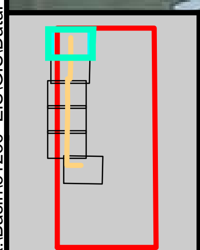

Legend

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0 500 1,000 2,000 Feet

NORTH

Source: USDA NAIP; ESRI; FWS NWI; FEMA; Basin Electric Power Cooperative

Deer Creek Station Project EIS
Basin Electric Power Cooperative
Brookings and Deuel Counties, SD
White Site 2 Project
Figure F

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APPENDIX C - PARTIAL LISTING OF WILDLIFE OBSERVED OR KNOWN TO OCCUR NEAR THE PROPOSED PROJECT

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APPENDIX C

Partial Listing of Wildlife Observed or Known to Occur near the Proposed Project

Scientific Name*	Common Name*
Mammals	
Odocoileus virginianus	White-tailed deer
Odocoileus hemiounus	Mule deer
Procyon lotor	Raccoon
Mustela nivalis	Least weasel
Mustela frenata	Long-tailed weasel
Mephitis mephitis	Striped skunk
Spilogale putorius	Spotted skunk
Taxidea taxus	American badger
Vulpes vulpes	Red fox
Vulpes velox	Swift fox
Urocyon cinereoargenteus	Common gray fox
Canis latrans	Coyote
Marmota monax	Woodchuck
Geomys bursarius	Plains pocket gopher
Spermophilus tridecemlineatus	Thirteen-lined ground squirrel
Spermophilus richardsonii	Richardson's ground squirrel
Sciurus niger	Eastern fox squirrel
Perognathus flavescens	Plains pocket mouse
Peromyscus leucopus	White-footed mouse
Onychomys leucogaster	Northern grasshopper mouse
Microtus pennsylvanicus	Meadow vole
Microtus ochrogaster	Prairie vole
Zapus hudsonius	Meadow jumping mouse
Sorex hoyi	Pygmy shrew
Cryptotis parva	Least shrew
Castor canadensis	Beaver
Lontra canadensis	River otter
Ondatra zibethicus	Muskrat
Sylvilagus floridanus	Eastern cottontail
Lepus townsendii	White-tailed jackrabbit
Lepus californicus	Black-tailed jackrabbit
Mustela nigripes	Black-footed ferret
Myotis septentrionalis	Northern myotis
Lasionycteris noctivagans	Silver-haired bat
Myotis lucifugus	Little brown myotis
Lasiurus borealis	Eastern red bat
Galleria mellonella	Big brown bat
Lasiurus cinereus	Hoary bat

Scientific Name*	Common Name*
Reptiles and Amphibians	
Anaxyrus americanus	American toad
Hyla chrysoscelis	Cope’s gray tree frog
Hyla versicolor	Gray tree frog
Spea bombifrons	Plains spadefoot
Lithobates sylvaticus	Plains leopard frog
Lithobates catesbeiana	Bullfrog
Ambystoma tigrinum	Tiger salamander
Eumeces septentrionalis	Prairie skink
Chelydra serpentine	Snapping turtle
Chrysemys picta	Painted turtle
Apalone spinifera	Spiny softshell
Diadophis punctatus	Ring-necked snake
Heterodon platirhinos	Eastern hognose snake
Elaphe vulpina	Western fox snake
Storeria occipitomaculata	Northern redbelly snake
Storeria dekayi	Brown snake
Thamnophis radix	Plains garter snake
Upland Game Birds	
Perdix perdix	Gray partridge
Tympanuchus phasianellus	Sharp-tailed grouse
Phasianus colchicus	Ring-necked pheasant
Meleagris gallopavo	Wild turkey
Zenaida macroura	Mourning dove
Avian Species	
Haliaeetus leucocephalus	Bald eagle
Aquila chrysaetos	Golden eagle
Pandion haliaetus	Osprey
Accipiter cooperii	Cooper’s hawk
Buteo jamaicensis	Red-tailed hawk
Pandion haliaetus	Osprey
Falco sparverius	American kestrel
Strix varia	Barred owl
Megascops asio	Eastern screech-owl
Bubo virginianus	Great horned owl
Bubo scandiacus	Snowy owl
Pelecanus erythrorhynchos	American white pelican
Botaurus lentiginosus	American bittern
Ixobrychus exilis	Least bittern
Ardea herodias	Great blue heron
Anas acuta	Northern pintail
Gallinago delicata	Wilson’s snipe
Anas platyrhynchos	Mallard
Podilymbus podiceps	Pie-billed grebe
Phalacrocorax auritus	Double-breasted comorant
Casmerodius albus	Great egret
Plegadis chihi	White-faced ibis
Chen caerulescens	Snow goose

Scientific Name*	**Common Name***
Branta canadensis	Canada goose
Aix sponsa	Wood duck
Anas crecca	Green-winged teal
Anas americana	American widgeon
Aythya valisineria	Canvasback
Aythya americana	Redhead
Mergus merganser	Common merganser
Oxyura jamaicensis	Ruddy duck
Grus americana	Whooping crane
Charadrius melodus	Piping plover
Larus pipixcan	Franklin's gull
Chlidonias niger	Black tern
Melanerpes erythrocephalus	Red-headed woodpecker
Calamospiza melanocorys	Lark bunting
Ammodramus bairdii	Baird's sparrow
Spizella passerina	Chipping sparrow
Calcarius ornatus	Chestnut-collared longspur
Spiza americana	Dickcissel
Bartramia longicauda	Upland sandpiper
Numenius americanus	Long-billed curlew
Capella gallinago	Common snipe
Coccyzus erythropthalmus	Black-billed cuckoo
Chordeiles minor	Common nighthawk
Ceryle alcyon	Belted kingfisher
Picoides pubescens	Downy woodpecker
Contopus virens	Eastern wood peewee
Icterus spurious	Orchard oriole
Agelaius phoeniceus	Red-winged blackbird
Sturnella neglecta	Western meadowlark
Xanthocephalus xanthocephalus	Yellow-headed blackbird
Lanius ludovicianus	Loggerhead shrike
Tyrannus verticalis	Western kingbird
Hirundo rustica	Barn swallow
Sturnus vulgaris	European starling
Tachycineta bicolor	Tree swallow
Turdus migratorius	American robin
Toxostoma rufum	Brown thrasher
Quiscalus quiscula	Common grackle

*This summary of occurrence information is based on a collection of data from SD-GAP Program (2001), data collected in the field in October 2008 by EDAW, Inc., and information provided by the SDGFP-Natural Heritage Program (SDNHP 2008)

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APPENDIX D – FISH SPECIES KNOWN OR LIKELY TO OCCUR IN OR NEAR THE PROPOSED PROJECT

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APPENDIX D

Fish Species Known or Likely to Occur in or near the Proposed Project*

Scientific Name	Common Name
Lepisosteus platostomus	Shortnose gar
Hiodon alosoides	Goldeye
Dorosoma cepedianum	Gizzard shad
Campostoma anomalum	Central stoneroller
Couesius plumbeus	Lake chub
Cyprinella lutrensis	Red shiner
Cyprinus carpio	Common carp
Hybognathus hankinsoni	Brassy minnow
Hybognathus placitus	Plains minnow
Luxilus cornutus	Common shiner
Macrhybopsis gelida	Sturgeon chub
Macrhybopsis storeriana	Silver chub
Nocomis biguttatus	Hornyhead chub
Notemigonus crysoleucas	Golden shiner
Notropis atherinoides	Emerald shiner
Notropis dorsalis	Bigmouth shiner
Notropis heterolepis	Blacknose shiner
Notropis hudsonius	Spottail shiner
Notropis rubellus	Rosyface shiner
Notropis stramineus	Sand shiner
Notropis topeka	Topeka shiner
Phenacobius mirabilis	Suckermouth minnow
Phoxinus eos	Northern redbelly dace
Pimephales notatus	Bluntnose minnow
Pimephales promelas	Fathead minnow
Hybognathus argyritis	Western silvery minnow
Platygobio gracilis	Flathead chub
Rhinichthys atratulus	Blacknose dace
Rhinichthys cataractae	Longnose dace
Semotilus atromaculatus	Creek chub
Ictiobus cyprinellus	Bigmouth buffalo
Ictiobus niger	Black buffalo
Carpiodes cyprinus	Quillback sucker
Carpiodes carpio	River carpsucker
Cycleptus elongatus	Blue sucker
Moxostoma macrolepidatum	Shorthead redhorse
Catostomus commersoni	White sucker
Catostomus platythynchus	Mountain sucker
Ictalurus punctatus	Channel catfish
Ameirus nebulosus	Yellow bullhead
Ameirus melas	Black bullhead
Noturus flavus	Stonecat
Noturus gyrunus	Tadpole madtom
Pylodictis olivaris	Flathead catfish

Scientific Name	**Common Name**
Percopsis amiscopmaycis	Trout perch
Fundulas diaphanus	Banded killfish
Fundulas sciadicus	Plains topminnow
Culaea inconstans	Brook stickleback
Morone chrysops	White bass
Pomoxis nigromaculatus	Black crappie
Pomoxis annularis	White crappie
Micropterus dolomieu	Smallmouth bass
Micropterus salmoides	Largemouth bass
Lepomis cyenallus	Green sunfish
Lepomis macrochirus	Bluegill
Lepomis gibbosus	Pumpkinseed
Lepomis humilis	Orangespotted sunfish
Stizostedion vitreum	Walleye
Stizostedion canadense	Sauger
Perca flevescens	Yellow perch
Percina caprodes	Logperch
Percina maculata	Blackside darter
Etheostoma nigrum	Johnny darter
Etheostoma exile	Iowa darter
Aplodinotus grunniens	Freshwater drum

*Information based upon review of the SDGFP Common Fish Identification Guide and SD-GAP program (2008)

APPENDIX E - SPECIAL STATUS SPECIES HABITAT DESCRIPTIONS

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APPENDIX E
Special Status Species Habitat Descriptions

American Burying Beetle

The American burying beetle is the largest of the carrion beetles in North America. The life cycle of the beetle includes approximately two to three months underground as larvae and pupae during the summer with adults also present underground during winter. The adults provide the larvae with a food source underground during this period. The species has been found in a variety of habitats (i.e. woodlands, prairies) in areas with relatively non-compacted soils, containing a measurable layer of humus or leaf litter, and with high prey abundance (Creighton and Schnell 1998, Lomolino and Creighton 1996, USFWS 1991). This noctural species will travel several miles to a variety of soil and habitat types if the appropriate food sources are available (Lomolino et al. 1995). American burying beetles are currently known to occur in counties in south-central South Dakota (Backlund et al. 2008); however, historic records exist from Brookings County (Backlund and Marrone 1997).

Topeka Shiner

The Topeka shiner (*Notropis topeka*) is a small, silvery minnow, typically less than 3 inches in total length, that occurs primarily in clear pools in small streams within prairie or former prairie streams. Current habitat for this species is limited to only a few watersheds in the United States; however within these watersheds the species may be found in relatively high abundance (Dahle 2001, 69 FR 44736-44770). Diet for this species is highly diverse, including vegetation matter, zooplankton, and small aquatic invertebrates (69 FR 44736-44770). The low-order, central prairie streams that Topeka shiners inhabit have ground-water levels and flows that have been found to be crucial for the survival of the species (Berg et al. 2004). The streams generally have high water quality, cool to moderate temperatures, as well as pool and run characteristics (Dahle 2001, Pflieger 1997). Topeka shiners have also been found in intermittent streams throughout their current range in isolated pools maintained by the percolation of ground water or underground springs (Minckley and Cross 1959; 69 FR 44736-44770). Topeka shiners have been recorded in small entrenched streams with high grazing pressure and bank erosion (69 FR 44736-44770). The South Dakota Management Plan (Shearer 2003) designates May 15 through July 31 as the Topeka shiner spawning period.

The Topeka shiner is known to occupy numerous small streams in eastern South Dakota. The species was recorded in 2000 in an unnamed tributary to Deer Creek approximately 1.5 miles northwest of water well supply sites A and B (SDNHP 2008). As a result, Deer Creek and its tributaries are considered to provide potential habitat for Topeka shiners. The Final Designation of Critical Habitat for the Topeka Shiner (69 FR 44736-44770) defers to Shearer (2003) for the management of Topeka shiner in South Dakota including designation of critical habitat within the state (69 FR 44736-44770). Portions of Deer Creek and the connected Medary Creek are classified as high habitat priority. Deer Creek and nearby tributaries range from high to low to moderate to low priority habitat throughout the proposed Project Area (Shearer 2003). The Deer Creek mainstem near the proposed Project Area is primarily classified as high priority habitat. The nearest designated critical habitat for the Topeka shiner is in Minnesota in the headwaters of Medary Creek, which confluences with Deer Creek downstream of the proposed Project. The designated critical habitat is located approximately eight miles southeast of the proposed Project.

The Medary Creek Complex critical habitat consists of two stream segments in Lincoln County, Minnesota. According to the critical habitat designation (69 FR 44736-44770), Topeka shiners recently have been captured from several localities in this complex. Primary threats to the Topeka shiner that require special management in this watershed include agricultural practices and channel maintenance that increases sedimentation and other water quality impacts. Special management for the Topeka shiner in this watershed would include grass waterways and riparian fencing to reduce erosion. To the south of Medary Creek and further from the proposed Project, Willow and Flandreau creeks are also designated critical habitat in Minnesota and South Dakota.

Western Prairie Fringed Orchid

The Federally-endangered western prairie fringed orchid (*Platanthera praeclara*) is a perennial herb with a showy flower. The species is restricted to areas west of the Mississippi and is currently found in Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, and Manitoba, Canada; the orchid has not been recently documented in South Dakota. However, there are recorded populations in Lincoln and Pipestone Counties in Minnesota (Owenby and Morley 1991), which are both adjacent to Brookings County. Western prairie fringed orchids are associated primarily with moist to mesic areas in intact, native tall grass prairie. The orchid is associated with native tall grass prairie species, including big bluestem, Indian grass, Kentucky bluegrass, and switch grass (Ladd and Oberle 1995). Other potential habitat includes wet prairies, sedge meadows, sub-irrigated prairies, and swales in sand dune complexes. In hydric habitats, the orchid is associated with communities dominated by sedges and spikerushes (USFWS 1996). They have, however, been found in roadside ditches and reclaimed grasslands.

Habitat of fair quality may exist within the proposed Project Area on both plant sites, all four water supply well sites, and the natural gas pipeline corridors. Although much of the proposed Project Area is disturbed, the western prairie fringed orchid has shown the ability to either persist through disturbance or colonize following disturbances in a manner similar to many other native prairie species. This is indicated by its presence along roadsides and reclaimed grasslands (Missouri Department of Conservation 2005, Sieg and King 1995).

Whooping Crane

The whooping crane (*Grus americana*) currently exists in three wild populations and at six captive locations. The only self-sustaining natural wild population nests in the Northwest Territories and adjacent areas of Alberta, Canada, primarily within the boundaries of Wood Buffalo National Park. The flock has recovered from a population low of 15 or 16 birds in 1941, to more than 200. These birds migrate through South Dakota and winter at Aransas National Wildlife Refuge and adjacent areas in Texas. The migration pathways of whooping cranes in the spring and fall are similar. From nesting grounds in northeast Alberta, the migration pathway extends 2,500 miles south-southeast through south-central Saskatchewan, northeast Montana, western North Dakota, central South Dakota, central Nebraska and Kansas, west-central Oklahoma, and east-central Texas. Overall, the migration corridor varies from 50 to 200 miles wide and could include the proposed Project Area as part of the corridor's eastern boundary. However, most documented observations of whooping cranes occur in central South Dakota along the Missouri River valley. According to the April 7, 2009 USFWS letter, the likelihood of whooping crane occurrence at the proposed Project Area is very low. To date there have been no documented sightings in Brookings County, although sightings have been recorded in Kingsbury and Clark Counties 40 to 60 miles away (Austin and Richert 2001).

According to the Whooping Crane Recovery Plan (USFWS and CWS 2005), the current threats include limited genetics of the population, loss and degradation of migration stopover habitat, construction of additional power lines, degradation of coastal habitat, and threat of chemical spills in Texas. Collisions with power lines are a substantial cause of whooping crane mortality in migration and are known to have accounted for the death or serious injury of at least 30 whooping cranes since 1956. In the 1980s, two of nine radio-marked whooping cranes died within 18 months as a result of power line collisions.

Dakota Skipper

The Dakota skipper (*Hesperia dacotae*) is a small butterfly with a one-inch wingspan. Its habitat is native prairie consisting of bluestem grasses and forbs for nectar. This habitat is often located along transition zones of mixed and tall grass prairie (USFWS 2007). Dakota skippers inhabit dry-mesic hill prairies with abundant coneflower species, but also use mesic to wet-mesic tallgrass prairie habitats characterized by wood lily and smooth camas. Patches of suitable skipper habitat may be present within Brookings and Deuel counties, and the Dakota skipper has been documented at Oak Lake, approximately 1.5 miles west of the proposed pipeline ROW (SDNHP 2008).

Northern Redbelly Dace

Northern redbelly dace (*Phoxinus eos*) is a minnow found in boggy lakes, ponds, pools of headwaters and creeks. It has a dark olive or brown back and a dark stripe along its side. The body is silver or cream below the stripe, but turns red in breeding males. Northern redbelly dace feed on algae and small invertebrates and spawn in algal mats from late spring through summer (Ashton and Dowd 1991). In South Dakota it is documented in the Big Sioux River basin. It has been recorded less than one-half mile to the west of the alternative gas pipeline ROW in drainages connected to Deer Creek.

Banded Killifish

Banded killifish (*Fundulus diaphanus*) typically occur in shallow areas of clear lakes and ponds with a muddy or sandy substrate, and abundant submerged aquatic vegetation for attaching eggs. They eat insect larvae, mollusks, and small crustaceans. They are known to occur in Deuel County in South Dakota (Ashton and Dowd, 1991; COSEWEC 2003).

Blacknose Shiner

The blacknose shiner (*Notropis heterolepis*) is a minnow that requires clean, cool, well-oxygenated streams with abundant aquatic vegetation. The calm pool areas of the stream are critical to the survival of the species (Pflieger 1997). It feeds primarily on small aquatic insects, crustaceans, and algae. The species may occur in Brookings County (SDGFP 2001).

Sturgeon Chub

The sturgeon chub (*Macrhybopsis gelida*) is a minnow that requires continuously turbid, medium to large warm water rivers. It occurs in shallow areas of strong current with a coarse sand or gravel bottoms. It is not known to occur in locations from the proposed Project Area (Ashton and Dowd 1991, NatureServe 2009)

Eastern Hognose Snake

The eastern hognose snake (*Heterodon platirhinos*) is typically found in wooded edges, grassy fields, and river valleys with loose (sandy loam) soils. The species burrows into the soil to overwinter. It feeds primarily on toads, frogs, and salamanders (Kiesow 2006). It is not known to occur in the proposed Project Area (SDGFP 2001).

Lined Snake

The lined snake (*Tropidoclonion lineatum*) is a small, brown snake that prefers prairies, hillsides, and woodland edges. It utilizes deep rocky outcroppings and small mammal burrows for hibernation (Kiesow 2006). It is not known to occur in the proposed Project Area (SDGFP 2001).

Northern Redbellied Snake

The northern redbellied snake is found in woodlands, moist grassy areas, and meadows near water (Behler 1996, Kiesow 2006). It is known from the area of the proposed gas pipeline corridor (SDGFP 2001).

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) has been removed from the endangered species list, but is still protected by the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712). It can be observed throughout the State of South Dakota, including Brookings County, during any time of the year (69 FR 44736-44770). Only partially migratory, the bald eagle can inhabit a variety of locations in North America as long as adequate nesting, feeding, and watering grounds are available. Bald eagles feed on fish, waterfowl, small mammals, and carrion. The bald eagle builds large nests in the tops of trees near marshes, lakes and rivers. The USFWS indicated that there were no known bald eagle nests in the proposed Project Area. Oak Lake and Lake Hendricks may provide suitable roosting and nesting habitat.

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APPENDIX F – STANDARD MITIGATION MEASURES

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Appendix F - Standard Mitigation Measures to be Used by Basin Electric for the Proposed Deer Creek Station Project

No.	Standard Mitigation Measure
General	
Gen-1	The requirements of all applicable Federal, State, and local environmental laws, executive orders, and regulations would be met during construction and operation of the proposed Project.
Gen-2	All permit conditions required by Federal, State, and local agencies would be adhered to for construction and operation of the proposed Project.
Gen-3	Prior to construction, all construction personnel and heavy equipment operators would be instructed on the protection of cultural, paleontological, and ecological resources, and all applicable permit requirements. Construction contracts would address: • Federal, State, and local laws regarding antiquities, fossils, plants, and wildlife, including collection/removal • The importance and necessity of protecting such resources • All applicable permit requirements
Air Quality	
Air-1	The emission of dust into the atmosphere during construction would be minimized to the extent practical during the manufacture, handling, and storage of concrete aggregate. Methods and equipment would be used as necessary to collect, dispose, or prevent dust during these operations. The methods of storing and handling cement and additives would also include means of minimizing atmospheric discharges of dust.
Air-2	All construction equipment and vehicles will be maintained in efficient operating condition. Vehicles and equipment that show excessive emissions or other inefficient conditions would not be operated until repairs or adjustments are made.
Air-3	All waste materials shall be disposed of at permitted waste disposal areas or landfills. Burning or burying waste materials on the right-of-way or plant construction area would not be permitted. Tree and grubbing residue may be buried on the plant site or in the right-of-way with landowner approval.
Air-4	Nuisance to persons, dwellings, or crops resulting from dust originating from construction would be minimized. Oil and other petroleum derivatives would not be used for dust control. Speed limits on local gravel roads would be

	enforced to reduce dust.
Water Resources	
Water-1	Construction activities would comply with the requirements of South Dakota permits for stormwater discharges for construction activities, which specify appropriate best management practices, erosion and sediment control measures, and disposal practices. Construction activities adjacent to or encroaching on streams or waterways, including work within rights-of-way, construction of access roads on hillsides, and dewatering work for structure foundations, or earthwork operations would be conducted to prevent disturbed soils, muddy water, and eroded materials from entering streams or waterways by construction of intercepting ditches, bypass channels, barriers, settling ponds, or by other approved means.
Water-2	Construction activities would be conducted to prevent the accidental spillage of solid matter contaminants, debris, hazardous liquids, or other pollutants into streams, waterways, lakes, land, and underground aquifers. Such pollutants and waste include, but are not restricted to, refuse, garbage, cement, concrete, sanitary waste, industrial waste, oil, and other petroleum products, aggregate processing tailing, mineral salts, and thermal pollution.
Water-3	Excavated material or construction materials would not be stockpiled or deposited near or on stream banks, lake shorelines, or other waterway perimeters unless protected from high water or storm runoff or encroachment upon the actual waterway itself.
Water-4	Wastewater discharge from any construction operations would not enter streams, waterways, or other surface waters without the appropriate permit(s).
Water-5	Equipment washing, storage of petroleum products, lubricants, solvents and hazardous materials, structure sites, and other disturbed areas would be located at least 100 feet, where practical, from rivers, streams (including ephemeral streams), ponds, lakes, and reservoirs. This includes construction vehicles and heavy equipment when parked overnight or longer.
Water-6	New access roads would be located at least 100 feet, where practical, from rivers, ponds, lakes, and reservoirs.
Water-7	All stream crossings considered jurisdictional by the USACE would be crossed by permit only. Where required, culverts of adequate size to accommodate the estimated peak flow of the stream would be installed. Disturbance of the stream banks and beds during construction would be minimized. Disturbed areas would be regarded and revegetated in accordance with mitigation measures listed for soil/vegetation resources.
Water-8	If the banks of ephemeral stream crossings are sufficiently high and steep that breaking them down for a crossing would cause excessive disturbance, culverts would be installed using the same measures as for culverts on perennial streams.

Water-9	Heavy equipment movement near streams and other surface waters would be minimized, to the extent practical.
Water-10	Narrow flood prone areas would be spanned.
Water-11	Proposed plant operation would comply with the SDDENR General Permit for Stormwater Discharges Associated with Industrial Activity and the associated stormwater pollution prevention plan, which requires use of appropriate BMPs, sediment control measures, and disposal practices. Proposed plant operations would be controlled and mitigated using BMPs. Operations would be conducted in a manner to prevent contamination of stormwater runoff that may leave the plant side and to prevent disturbed soils, muddy water, and eroded materials from entering the streams or waterways. BMPs would include intercepting ditches, bypass channels, barriers, settling ponds, or other approved measures.
Geology and Minerals, Paleontology, and Soils	
Geo-1	Removed topsoil would be used for landscaping and as engineered fill, as appropriate, or stockpiled and re-spread subsequent to construction.
Geo-2	During construction, if any paleontological resources are discovered, work would cease within a 50-foot radius of the discovery. Any artifacts or fossils discovered would not be disturbed and Western and RUS would be notified of the discovery immediately.
Geo-3	Access roads would generally follow the contour of the land to the greatest extent practical rather than a straight line along the right-of-way where steep features would result in a higher erosion potential.
Geo-4	To the extent practical, excavated areas would be re-contoured so that large volumes of water would not collect and stand therein. Before being abandoned, the sides of excavations would be brought to stable slopes, giving a natural appearance, and revegetated. Waste soil piles would be shaped to provide a natural appearance.
Biological Resources	
Bio-1	All wetland and riparian areas would be avoided to the extent practical. If wetland or riparian areas are unavoidable, impacts would be minimized or mitigated. Jurisdictional waters that are impacted as a result of implementing the proposed Project would be mitigated in accordance with USACE requirements.
Bio-2	Care would be used in preserving the natural landscape and vegetation. Construction operations would be conducted to prevent, to the extent practical, any unnecessary destruction, scarring, or defacing of the natural surroundings, vegetation, trees, and native shrubbery in the vicinity of the work. Vegetation would be replaced at landowner’s request, providing mitigation complying with North American Electric Reliability Council (NERC) requirements.
Bio-3	Upon completion of work, all non-agricultural disturbed areas and construction staging areas not needed for

	maintenance access would be regraded so that all surfaces drain naturally, blend with the natural terrain, and are reseeded to blend with native vegetation with a seed mixture certified as free of noxious or invasive weeds. All destruction, scarring, damage, or defacing of the landscape resulting from construction would be repaired.
Bio-4	Construction staging areas would be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent. Unless otherwise agreed upon by the landowner, all storage and construction buildings and all construction materials and debris would be removed from the construction staging areas once construction is complete, and the areas returned to original use or regraded and seeded as for non-agricultural disturbed areas.
Bio-5	Removal of vegetation would be done according to NERC safety and reliability requirements. Clearing for access roads would be limited to only those trees necessary to permit the passage of equipment. All vegetative materials resulting from clearing operations would either be chipped on site or stacked in the right-of-way in accordance with the landowner's request.
Bio-6	Native shrubs that would not interfere with access or the safe operation of the transmission line would be allowed to reestablish in the right-of-way. Areas with native shrubs that would be disturbed would be replanted with regionally-native species following the disturbance.
Bio-7	An Avian Protection Plan (APP) to minimize impacts to nesting birds, as well as to minimize the electrocution and collision of migratory and resident bird species, would be developed and implemented. The APP would include provisions for adequate distance between conductors and distances between conductors and grounded surfaces. The APP would identify time frames for construction and routine maintenance to avoid the nesting period of breeding birds. It would also include methods for minimizing bird collisions during line routing as well as methods for minimizing collisions following construction. The APP would follow guidelines described at www.aplic.org . The APP would be provided to the USFWS and State wildlife agency for comment. A copy of the APP would be provided to Western, RUS, and the applicable USFWS and State wildlife agency offices.
Bio-8	Holes drilled or excavated for pole placement or foundation construction and left unattended overnight would be marked and secured with temporary fencing to reduce the potential for livestock and wildlife to enter the holes, and for public safety.
Land Use	
Land-1	The minimum area necessary would be used for access roads during project construction.
Land-2	When practical, transmission structures would be located and designed to conform to the terrain. Leveling and benching of the structure sites would be the minimum necessary to allow structure assembly and erection.

Land-3	Transmission structures would be located, where practical, to span sensitive land uses. Where practical, construction access roads would be located to avoid sensitive conditions.
Land-4	The precise location of all structure sites, right-of-way, and other disturbed areas would be determined with landowners' or land management agencies' input.
Land-5	The movement of crews and equipment would be limited to the right-of-way and areas surveyed for cultural, historical, and biological resources, including access routes. To the extent practicable, the contractor would limit movement on the right-of-way to minimize damage to grazing land, crops, or property and would avoid marring the land.
Land-6	Where practical, construction activities would be scheduled during periods when agricultural activities would be minimally affected or the landowner would be compensated accordingly.
Land-7	Fences, gates, and similar improvements that are removed or damaged would be promptly repaired or replaced.
Land-8	Transmission structure design and placement would be selected to reduce potential conflicts with agricultural practices and to reduce the amount of land required for transmission lines.
Land-9	Right-of-way would be purchased through negotiations with each landowner affected by the proposed Project. Payment would be made of full value for crop damages or other property damage during construction or maintenance.
Land-10	When weather and ground conditions permit, all deep ruts that are hazardous to farming operations and equipment movement would be eliminated or compensation would be provided as an alternative if the landowner desires. Such ruts would be leveled, filled, and graded, or otherwise eliminated in an approved manner. Ruts, scars, and compacted soils from construction activities in productive hay or crop lands would be loosened and leveled by scarifying, harrowing, disking, or other appropriate methods. Damage to ditches, tile drains, terraces, roads, and other land features would be corrected. Land contours and facilities would be restored as nearly as practical to their original conditions.
Land-11	Where practical, all well drilling and installation would be completed in agricultural areas or uncultivated pastureland at the edge of farm fields. During pump testing, precautions would be taken to prevent erosion due to discharges of groundwater.
Land-12	To the extent possible, pipeline routing would occur along the right-of-way of county and township roads and along section lines, and along access roads.
Public Health and Safety	
PH-1	When appropriate, pilot vehicles would accompany the movement of heavy equipment. Traffic control barriers and

	warning devices would be used when appropriate.
PH-2	All necessary provisions would be made to conform to safety requirements for maintaining the flow of public traffic and avoiding congestion at critical locations. Construction operations would be conducted to offer the least possible obstruction and inconvenience to public traffic, such as by the use of pilot cars to accompany trucks with oversized loads and slow-moving vehicles, scheduling heavy equipment transport to avoid high traffic periods, and where feasible, use of existing rail facilities.
PH-3	Design would include reasonable mitigation measures to reduce problems of induced currents into conductive objects within the right-of-way. Problems of induced currents during construction and operation would be resolved, to the mutual satisfaction of the parties involved.
PH-4	Complaints of radio or television interference generated by the facility and related transmission lines would be investigated and appropriate mitigation measures would be implemented.
PH-5	Audible noise and electric and magnetic fields during construction and operation of the proposed Project would be addressed as necessary on a case-by-case basis.
PH-6	Transmission line materials would be designed to minimize corona. Tension would be maintained on all insulator assemblies to assure positive contact between insulators, thereby avoiding sparking. Caution would be exercised during construction to avoid nicking the conductor surface, which may provide points for corona to occur.
PH-7	The construction contractor would establish a health and safety program that incorporates Occupational Safety and Health Administration (OSHA) standards such as requirements for hearing protection, personal protective equipment, site access, chemical exposure limits, safe work practices, training program, and emergency procedures. The program would be reviewed with plant officials, fire department personnel, and emergency services personnel to reduce risk of construction and operation activities interfering with emergency response or evacuation plans and procedures.
PH-8	At the end of every work day, contractors would secure all construction areas to protect equipment and materials and discourage public access. Fueling of vehicles would be conducted in compliance with established procedures designed to minimize fire risks and fuel spills.
PH-9	Construction contractors would provide adequate notice to the public for all high-risk operations such as blasting. Only trained personnel would be permitted to conduct such high-risk operations. All other personnel would be required to maintain a safe distance from such operations.
Visual Resources	
Vis-1	The proposed Project major components would be painted to blend into the surrounding environment. Lighting

	would be minimized, to the extent practical. Lights would be shielded to minimize output to the surrounding environment and impacts to the night sky.
Vis-2	Structure types (designs) would be uniform, to the extent practical.
Vis-3	Transmission line materials would be designed to minimize corona. To reduce potential visual impacts at highway and trail crossings, structures would be placed at the maximum feasible distance from the crossing, within limits of structure design.
Noise	
Noise-1	An adequate buffer would be maintained around the proposed plant site to minimize construction and operational noise impacts on area residents.
Noise-2	Power lines would be designed to minimize noise and other effects from energized conductors.
Noise-3	To avoid nuisance noise conditions, transmission line construction would be limited to daytime hours whenever practical.
Noise-4	To avoid nuisance conditions due to construction noise, all internal combustion engines used in connection with construction activity would be fitted with an approved muffler and spark arrester.

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APPENDIX G – CONSTRUCTION DIAGRAMS FOR TRENCHING/DRILLING

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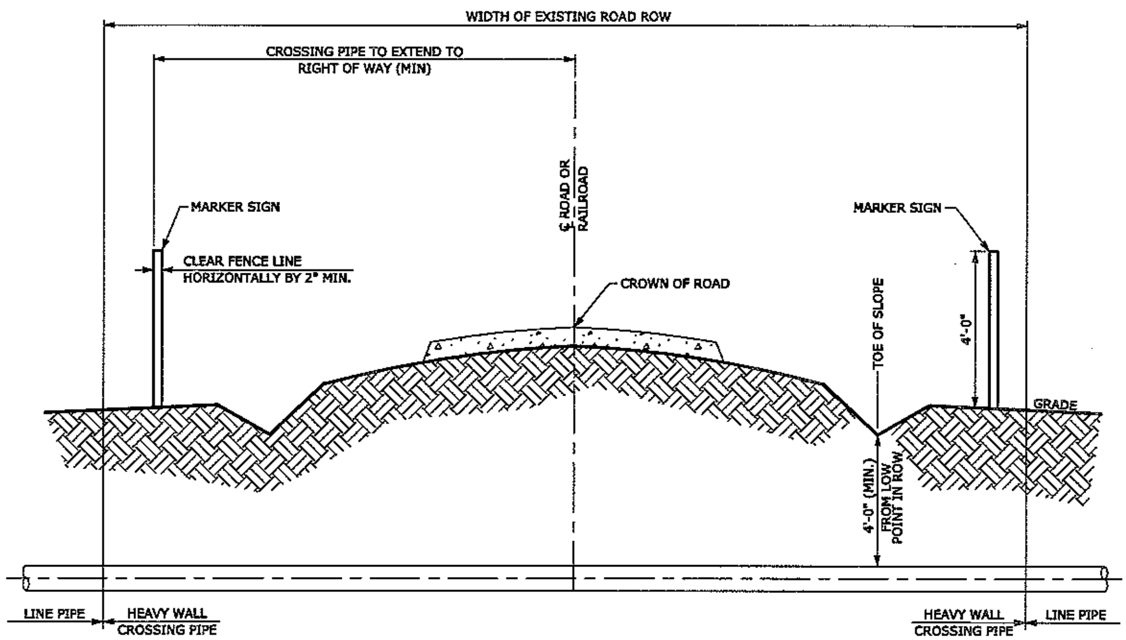


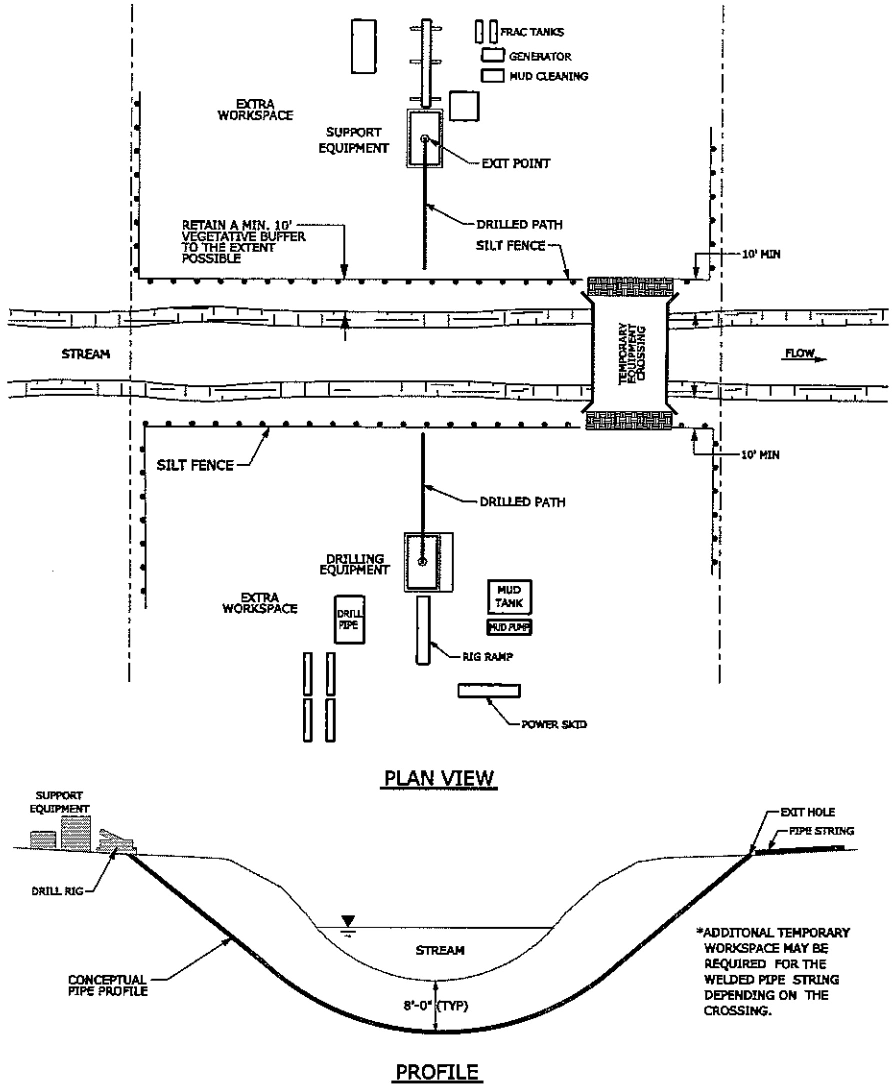
TYPICAL UNCASED BORED
ROAD CROSSING

NOTES:

1. Road crossings shall comply with applicable permits.
2. Road crossing pipe shall be straight with no vertical or horizontal bends within the road right-of-way.
3. The minimum required pipe length and type of pipe shall be specified on the alignment sheets.
4. The pipe used for bored crossings shall include abrasion-resistant (ARB) coating.
5. Pipeline markers and test stations shall be installed on the right-of-way edge next to a fence if possible.

ProSource TECHNOLOGIES, INC.	DEER CREEK PIPELINE PROJECT Basin Electric	TYPICAL UNCASED ROAD CROSSING BORE METHOD MONTANA-DAKOTA UTILITIES CO. A Division of MDU Resources Group, Inc.

Exhibit 3.9-2 Typical Roadway Horizontal Directional Drilling Plan

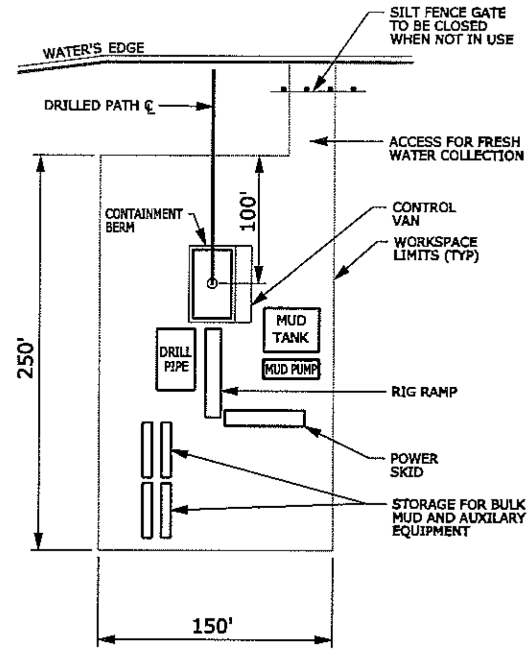


NOTES:

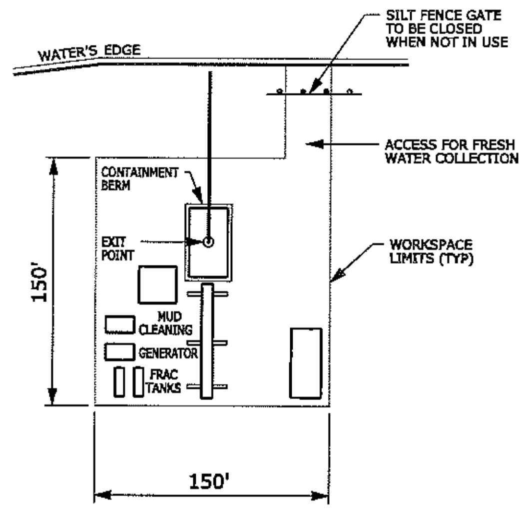
1. Maintain a 10 foot vegetative buffer if possible between the disturbed area and the stream.
2. Limit clearing to only the area needed for construction.
3. Install timber mats for equipment staging as necessary.
4. Install silt fence and/or other sediment barriers based on site specific conditons.
5. No refueling within 100 feet of a stream.
6. Install trench breakers and permanent slope breakers as needed.
7. Actual site layout may be modified based on site specific conditions.
8. Temporary equipment crossing will be installed outside of high water mark.

ProSource TECHNOLOGIES, INC.	DEER CREEK PIPELINE PROJECT Basin Electric	STREAM CROSSING TYPICAL HORIZONTAL DIRECTIONAL DRILL (HDD) SITE PLAN & PROFILE MONTANA-DAKOTA UTILITIES CO. A Division of MDU Resources Group, Inc.

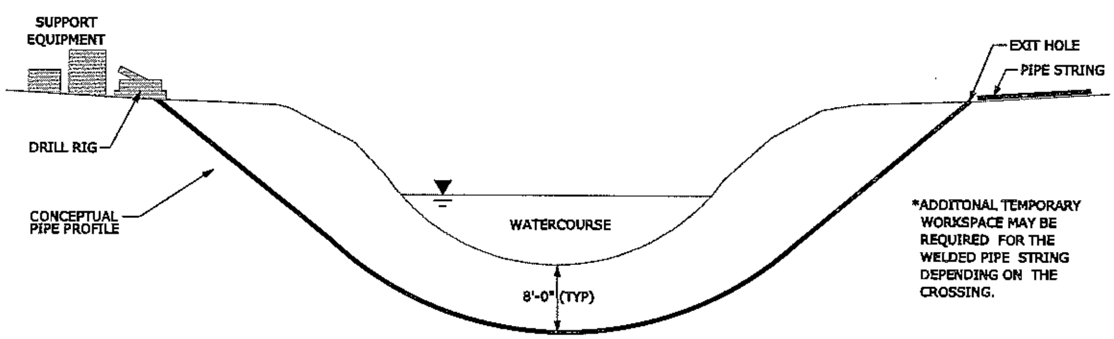
Exhibit 3.9-3 Typical Waterway Horizontal Directional Drilling Plan



SITE PLAN-ENTER SIDE



SITE PLAN-EXIT SIDE



PROFILE

NOTES:

1. To minimize impacts, install timber mats for equipment staging if necessary.
2. Install silt fence and/or other sediment barriers as needed.
3. No refueling within 100 feet of a waterbody.
4. Actual site layout may be modified based on site specific conditions.

ProSource TECHNOLOGIES, INC.	DEER CREEK PIPELINE PROJECT Basin Electric	TYPICAL HORIZONTAL DIRECTIONAL DRILL (HDD) SITE PLAN & PROFILE MONTANA-DAKOTA UTILITIES CO. A Division of MDU Resources Group, Inc.

Exhibit 3.9-4 Typical Horizontal Directional Drilling Operation Diagram

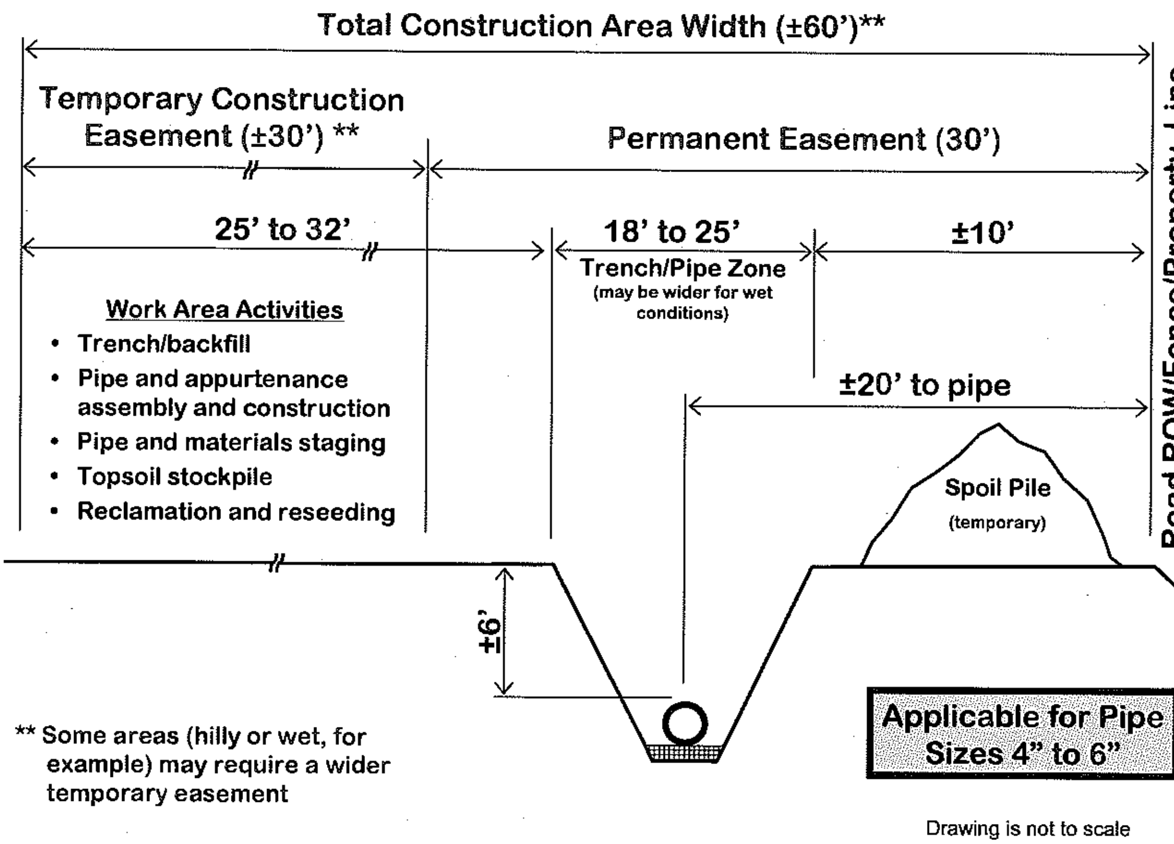


Exhibit 3.9-1 Typical Water Pipeline ROW Cross Section

COVER SHEET

LEAD FEDERAL AGENCIES: U.S. Department of Energy (DOE), Western Area Power Administration (Western); U.S. Department of Agriculture (USDA), Rural Utilities Service (RUS)
COOPERATING AGENCIES: U.S. Department of the Interior (DOI), U.S. Fish and Wildlife Service (USFWS)
TITLE: Draft Environmental Impact Statement for the South Dakota PrairieWinds Project, DOE/EIS-0418
LOCATION: Aurora, Brule, and Jerauld counties; or Tripp County, South Dakota

CONTACT:

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Washington, DC 20250-1571
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E-mail: dennis.rankin@wdc.usda.gov

For additional information on DOE National Environmental Policy Act (NEPA) activities, please contact Carol M. Borgstrom, Director of NEPA Policy and Compliance, GC-20, U.S. Department of Energy, 1000 Independence Avenue SW., Washington DC 20585, phone: (800) 472-2756 or visit the DOE NEPA Web site at www.eh.doe.gov/nepa.

ABSTRACT: PrairieWinds, SD1, Incorporated (PrairieWinds) is a wholly owned subsidiary of Basin Electric Power Cooperative (Basin Electric). PrairieWinds proposes to construct, own, operate, and maintain the South Dakota PrairieWinds Project, a 151.5-megawatt (MW) nameplate capacity wind-powered generation facility, including 101 General Electric 1.5-MW wind turbine generators, electrical collector lines, collector substation, transmission line, communications system, and service access roads to access wind turbine sites. Two alternative locations are being evaluated for the proposed project. One alternative is located on about 37,000 acres approximately 15 miles north of White Lake, South Dakota, within Brule, Aurora, and Jerauld counties, South Dakota. For this alternative, the requested interconnection is with Western's electric transmission system at Wessington Springs Substation, located in Jerauld County, South Dakota. The other alternative is located on about 83,000 acres approximately eight miles south of Winner, South Dakota, entirely within Tripp County, South Dakota. For this alternative, the interconnection is with Western's electric transmission system at Winner Substation, located in Tripp County, South Dakota. Western's purpose and need is to respond to Basin Electric's interconnection request under Western's Open Access Transmission Service Tariff and make a decision whether to approve or deny the interconnection request. If the decision is to approve the request, Western's action would include making necessary system modifications to accommodate the interconnection of the proposed project. PrairieWinds has requested financial assistance for the proposed project from RUS. RUS's Federal action is whether to approve or deny financial assistance; accordingly, completing the Environmental Impact Statement is one requirement, along with other technical and financial considerations in processing the PrairieWinds application.

Comments on this Draft Environmental Impact Statement should be sent to Western Area Power Administration at the address below. Comments must be postmarked no later than March 1, 2010.

Ms. Liana Reilly, NEPA Document Manager
Western Area Power Administration, Corporate Services Office
P.O. Box 281213
Lakewood, CO 80228-8213

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Appendix A Scoping Materials
Appendix B Engineering Drawings
Appendix C Biological Resources
Appendix D Cultural Resources

Acronym and Abbreviation List

ADT	Average daily traffic
AMSL	Above mean sea level
APE	Area of Potential Effects
APLIC	Avian Power Line Interaction Committee
APMs	Applicants' Proposed Measures
ABPP	Avian and Bat Protection Plan
Applicants	Basin Electric Power Cooperative and PrairieWinds SD1, Incorporated
AR	Administrative Rule
AWEA	American Wind Energy Association
BA	Biological Assessment
Basin Electric	Basin Electric Power Cooperative
BCC	Birds of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
bgs	Below ground surface
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMPs	Best Management Practices
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO_2	Carbon dioxide
CR	County Road
CRP	Conservation Reserve Program
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted decibel
DEIS	Draft Environmental Impact Statement
DENR	Department of Environment and Natural Resources
DOE	U.S. Department of Energy
DR	Department Regulation
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EMF	Electric and magnetic fields
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIRM	Flood insurance rate map
FPPA	Farmland Protection Policy Act
FR	*Federal Register*
FSA	Farm Service Agency

G	Gauss
Gal	Gallon
GHG	Greenhouse Gas
GIS	Geographic Information System
GPA	Game Production Areas
Hz	Hertz
I	Interstate
IEC	International Electrotechnical Commission
IPCC	Intergovernmental Panel on Climate Change
Intertribal COUP	Intertribal Council on Utility Policy
K	Soil erodibility factor
KOP	Key Observation Point
kV	Kilovolt
kWh	Kilowatt Hour
LCIC	Lewis and Clark Interpretive Center
LCTDR	Lewis and Clark Trail Driving Route
L_{dn}	Day-night average sound level
$L_{eq(1-h)}$	The sound equivalency over 1 hour
L	Liter
LGIA	Large Generator Interconnection Agreement
LGIP	Large Generator Interconnection Procedures
MBTA	Migratory Bird Treaty Act
mG	Milligauss
MISO	Midwest Independent Transmission System Operator
MOA	Memorandum of Agreement
mph	Miles per hour
µT	Microtesla
MW	Megawatt
MWh	Megawatt-hours
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHT	Lewis and Clark National Historic Trail
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries
NO_2	Nitrogen dioxide
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O_3	Ozone
O&M	Operation and maintenance
OSHA	Occupational Safety and Health Administration

Pb	Lead
PII	Potential Impact Index
$PM_{2.5}$	Particulate matter less than 2.5 microns in diameter
PM_{10}	Particulate matter less than 10 microns in diameter
PPR	Prairie Pothole Region
PrairieWinds	PrairieWinds SD1, Incorporated
Proposed Project	Proposed South Dakota PrairieWinds Project
PSA	Power Supply Analysis
RE Act	Rural Electrification Act
REOs	Renewable Energy Objectives
ROD	Record of Decision
ROI	Region of Influence
RPS	Renewable Portfolio Standards
RSA	Rotor Sweep Area
RUS	Rural Utilities Service
SCADA	Supervisory control and data acquisition
SDAAQS	South Dakota Ambient Air Quality Standards
SDCL	South Dakota Codified Laws
SDDL	South Dakota Department of Labor
SDDOT	South Dakota Department of Transportation
SDDPR	South Dakota Division of Parks and Recreation
SDGFP	South Dakota Game, Fish and Parks
SDGS	South Dakota Geological Survey
SDNHP	South Dakota Natural Heritage Program
SDOC	South Dakota Office of Climate
SDPUC	South Dakota Public Utilities Commission
SF_6	Sulfur hexafluoride
SGIA	Small Generator Interconnection Agreement
SGIP	Small Generator Interconnection Procedures
SHPO	State Historic Preservation Office
sle	Super long extreme
SO_2	Sulfur dioxide
SPCC	Spill Prevention Control and Countermeasures Plan
SR	State Route
SSURGO	Soil Survey Geographic Database
SUP	Special Use Permit
SWPPP	Storm Water Pollution Prevention Plan
T	Tesla
Tariff	Open Access Transmission Tariff
TCP	Traditional Cultural Properties
TSS	Total suspended solids
USACE	U.S. Army Corps of Engineers
U.S.C.	U.S. Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

US	U.S. Highway
V/m	Volts per meter
WEST	Western EcoSystems Technology, Inc.
Western	Western Area Power Administration
WMD	Wetland Management District
WPA	Waterfowl Production Areas
WRAN	Wind Resource Assessment Network
WUS	Waters of the U.S.

Metric Conversions

Metric Prefixes

Prefix	Symbol	Multiplication Factor	
mega-	M	1 000 000 =	10^{6}
kilo-	k	1 000 =	10^{3}
deci-	d	0.1 =	10^{-1}
milli-	m	0.001 =	10^{-3}
micro-	μ	0.000 001 =	10^{-6}

Conversion Chart

If You Know	To Convert into Metric, Multiply By	To Get	If You Know	To Convert into English, Multiply By	To Get
Length					
inch	2.54	centimeter	centimeter	0.3937	inch
feet	30.48	centimeter	centimeter	0.0328	feet
feet	0.3048	meter	meter	3.281	feet
yard	0.9144	meter	meter	1.0936	yard
mile	1.60934	kilometer	kilometer	0.62414	mile
Area					
acre	0.40469	hectare	hectare	2.471	acre
square mile	2.58999	square kilometer	square kilometer	0.3861	square mile
Volume					
gallon	3.7854	liter	liter	0.26417	gallon
gallon	0.0039	cubic meter	cubic meter	256.14	gallon
cubic yard	0.76455	cubic meter	cubic meter	1.308	cubic yard
Temperature					
Fahrenheit	subtract 32, then multiply by 5/9	Celsius	Celsius	multiply by 9/5, then add 32	Fahrenheit

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1 Introduction

This chapter briefly describes the proposed South Dakota PrairieWinds Project (Proposed Project), the purpose and need for Federal agency action and the project's purpose and objectives, and summarizes the scoping process. This draft environmental impact statement (DEIS) informs decision-makers and the public of the potential environmental impacts that could result from the Proposed Project. The DEIS was prepared under the direction of the U.S. Department of Energy's (DOE) Western Area Power Administration (Western) and the U.S. Department of Agriculture's (USDA) Rural Utilities Service (RUS). Western and RUS are collectively termed the "Agencies." The U.S. Fish and Wildlife Service (USFWS) was a cooperator for the DEIS. The DEIS will be used by the responsible Federal officials to make an informed decision on the proposed Federal actions.

PrairieWinds SD1, Incorporated (PrairieWinds), a subsidiary of Basin Electric Power Cooperative (Basin Electric), has proposed to develop a wind-powered generating facility in south-central South Dakota, either near the Town of Wessington Springs or near the City of Winner. Basin Electric has requested to interconnect the Proposed Project with the transmission system owned and operated by Western. PrairieWinds has requested financing for the Proposed Project from RUS. PrairieWinds and Basin Electric are collectively termed the "Applicants."

Basin Electric's generator interconnection request and PrairieWinds' financing request trigger a National Environmental Policy Act (NEPA) review process of the Proposed Project by Western and RUS, respectively. The Agencies have determined that an environmental impact statement (EIS) is required and are serving as co-lead Federal Agencies for preparation of the document. RUS is the lead Federal agency for consultation with the USFWS under Section 7 of the Endangered Species Act (ESA). The Proposed Project must consider impacts to cultural resources under NEPA. Western is the lead Federal agency for Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR 800), which include the identification, management and treatment of cultural resources, as well as the government-to-government consultation process. The Section 106 and NEPA reviews are conducted with an integrated approach.

Native American tribes and agencies with jurisdiction or special expertise have been invited to be cooperating agencies. The USFWS has accepted to participate as a cooperating agency for the Proposed Project.

Western and RUS are preparing this EIS in compliance with NEPA. The EIS will analyze the impacts of their respective proposed Federal actions and the Proposed Project in accordance with NEPA, as amended, DOE NEPA Implementing Procedures (Title 10 Code of Federal Regulations [CFR] Part 1021), the Council on Environmental Quality (CEQ) regulations for implementing NEPA (Title 40 CFR Parts 1500–1508) and RUS Environmental Policies and Procedures (Title 7 CFR Part 1794).

1.1 PROJECT OVERVIEW AND DESCRIPTION

Figure 1.1 depicts the wind resource potential in South Dakota (NREL 2009). **Figure 1.2** depicts the Proposed Project alternatives. Two alternative sites, Crow Lake and Winner, are under consideration for the wind-powered generation facility. The Crow Lake Alternative would be located on approximately 37,000 acres and is approximately 15 miles north of White Lake, and 17 miles southwest of Wessington Springs, South Dakota, within Brule, Aurora and Jerauld counties. The Winner Alternative would be located on approximately 83,000 acres entirely within Tripp County, and is approximately 8 miles south of Winner, South Dakota. Individual maps of each of the Proposed Project alternatives are included as Crow Lake Alternative in **Figure 1.3** and Winner Alternative in **Figure 1.4**.

The Proposed Project would involve the installation and operation of a 151.5-megawatt (MW) nameplate capacity wind energy facility that would feature 101 wind turbine generators. Ten additional turbine locations were identified and analyzed in this DEIS. These turbines may be utilized as contingent turbine locations for the Proposed Project if specific turbine locations are eliminated as a result of additional resource surveys and engineering siting; or they may be installed within the selected site at a later date, pending future load, transmission availability and renewable production standard requirements. Each turbine would have a hub height of 262 feet and a rotor diameter of 252 feet. The total height of each wind turbine would be 389 feet with a blade in the vertical position. The towers would be constructed of tubular steel, approximately 15 feet in diameter at the base, with internal joint flanges. The color of the towers and rotors would be standard white or off-white. During construction, a work/staging area at each turbine would include the crane pad and rotor assembly area, temporarily disturbing an area of approximately 500 feet by 500 feet; and permanently disturbing a 25-foot radius around each turbine.

Each wind turbine would be connected by a service road for access and a 34.5-kilovolt (kV) underground electrical collection system that would ultimately route the power from each turbine to one central collector substation, where voltage would be increased for interconnection to Western's transmission system. Approximately 30 to 40 miles of new access roads would be built to facilitate construction and maintenance of the turbines. Approximately 25 to 35 miles of existing roads would be used and, where appropriate, improved. The underground collector system trench would be approximately 60 miles long. The communication system would be located within the same trenches. The collector substation and transmission line are further described within each alternative discussion below.

The Crow Lake Alternative would require a new 34.5-kV to 230-kV collector substation as well as a 230-kV transmission line to interconnect to a new 230-kV interconnection point at Western's existing Wessington Springs Substation, in Jerauld County. The Wessington Springs Substation is approximately nine miles from the proposed collector substation. Regardless of route, the transmission line length would be approximately 11 miles. The proposed line would be built using steel single-pole structures. The structures would be between 85 and 95 feet high with a span of about 800 feet.

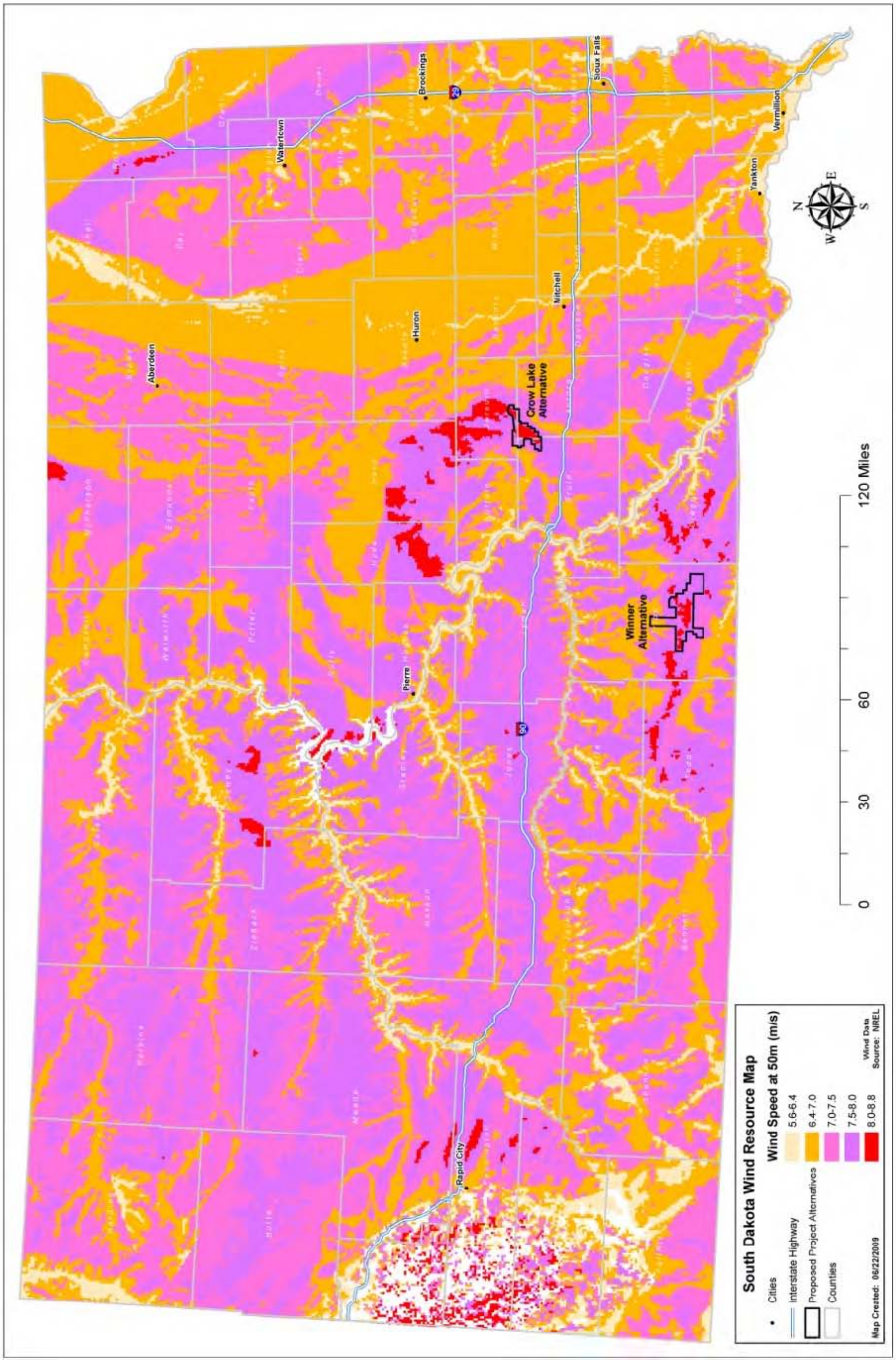


Figure 1.1 South Dakota Wind Resource Map

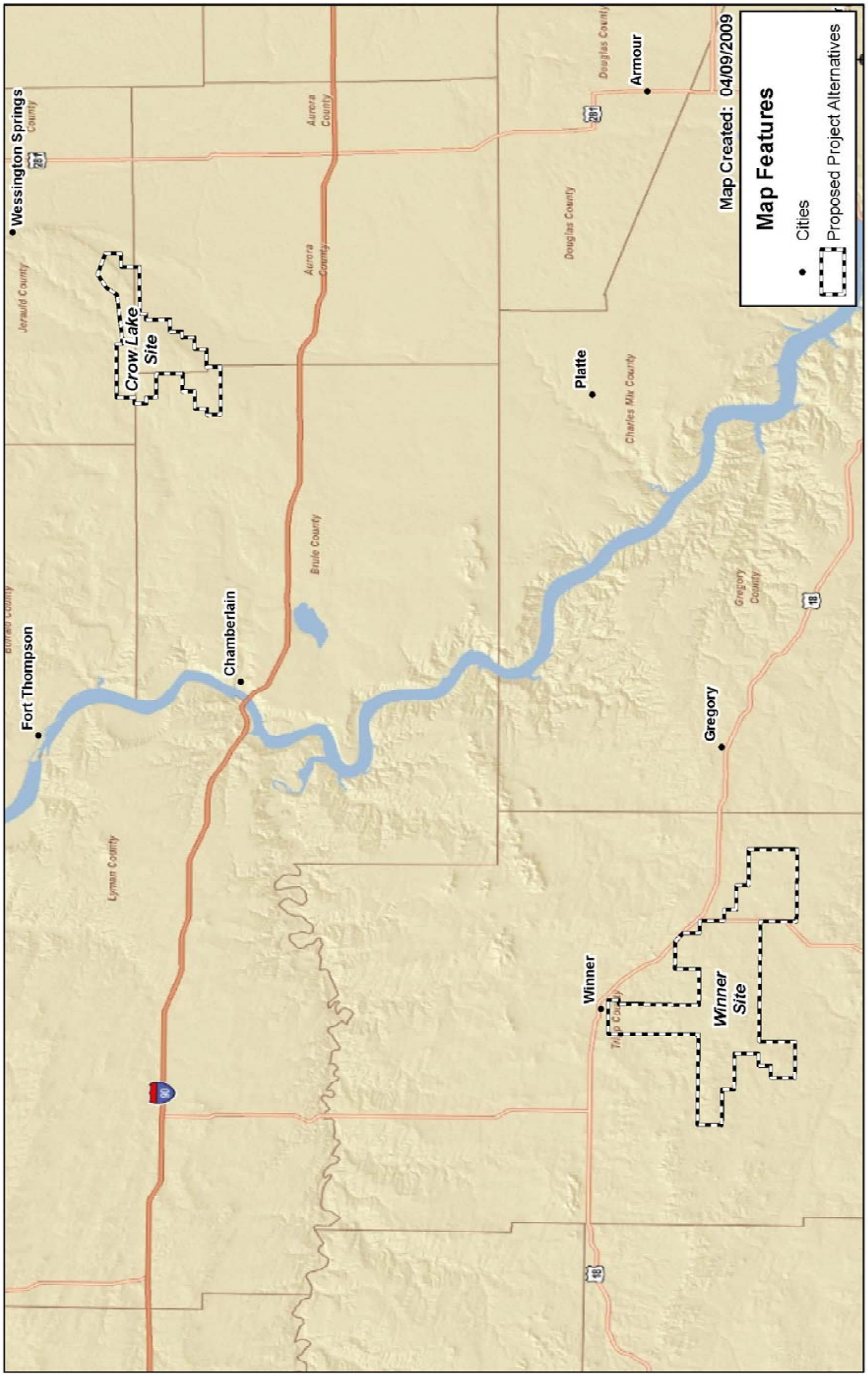
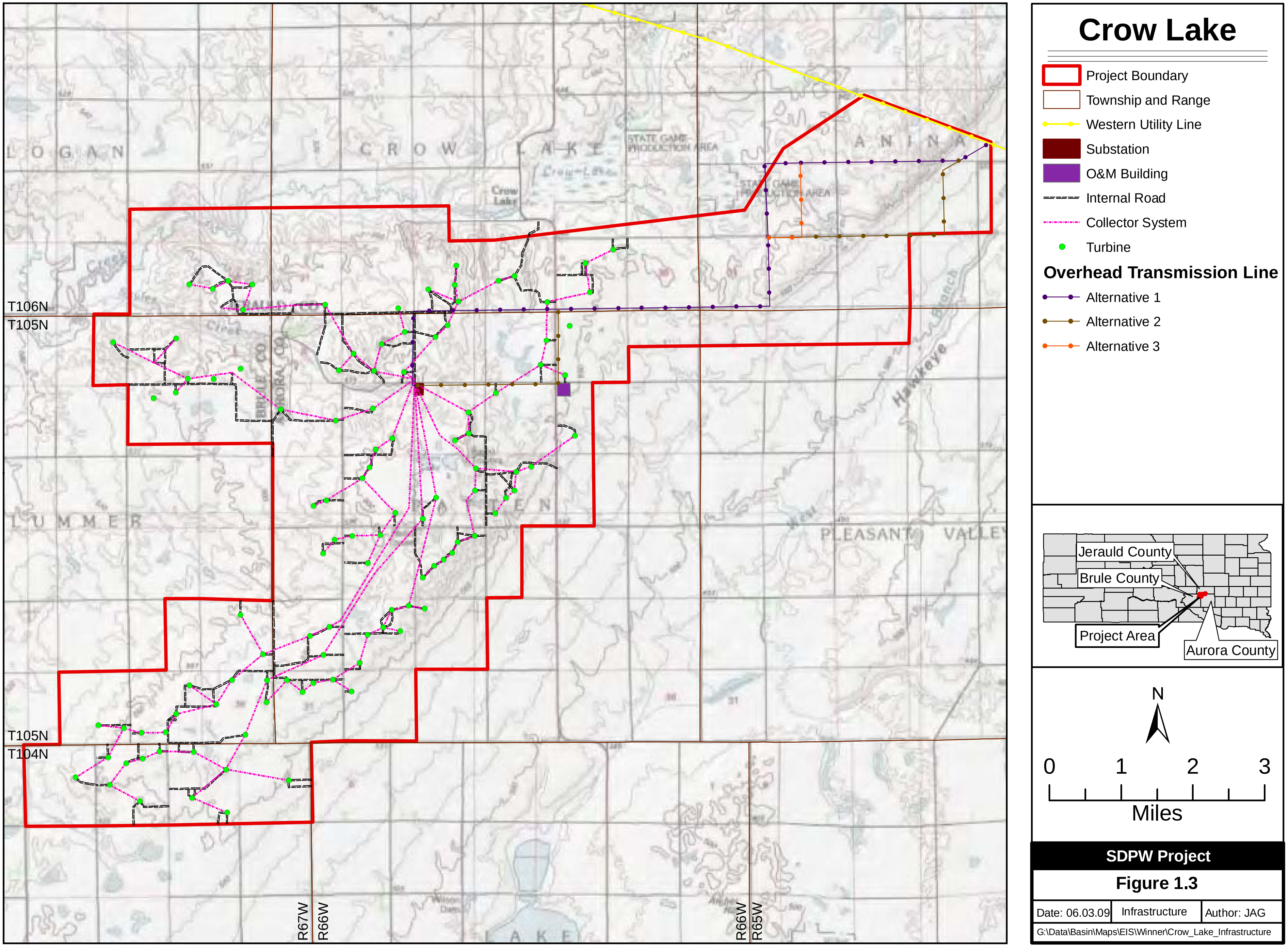


Figure 1.2 Proposed Project Alternatives



Due to engineering considerations, the transmission line Alternative 1 location includes area outside of the Crow Lake Alternative boundary; this boundary will be revised to include the transmission line route in the FEIS.

The Winner Alternative would require one new 34.5-kV to 115-kV collector substation as well as a 115-kV transmission line to interconnect to Western's existing 115-kV Winner Substation, in Tripp County. The Winner Substation is approximately nine miles from the proposed collector substation. Depending on route, the proposed transmission line would be approximately 10 to 11 miles long. Other facilities necessary for this site would be similar to those described for the Crow Lake Alternative.

1.2 PURPOSE AND NEED

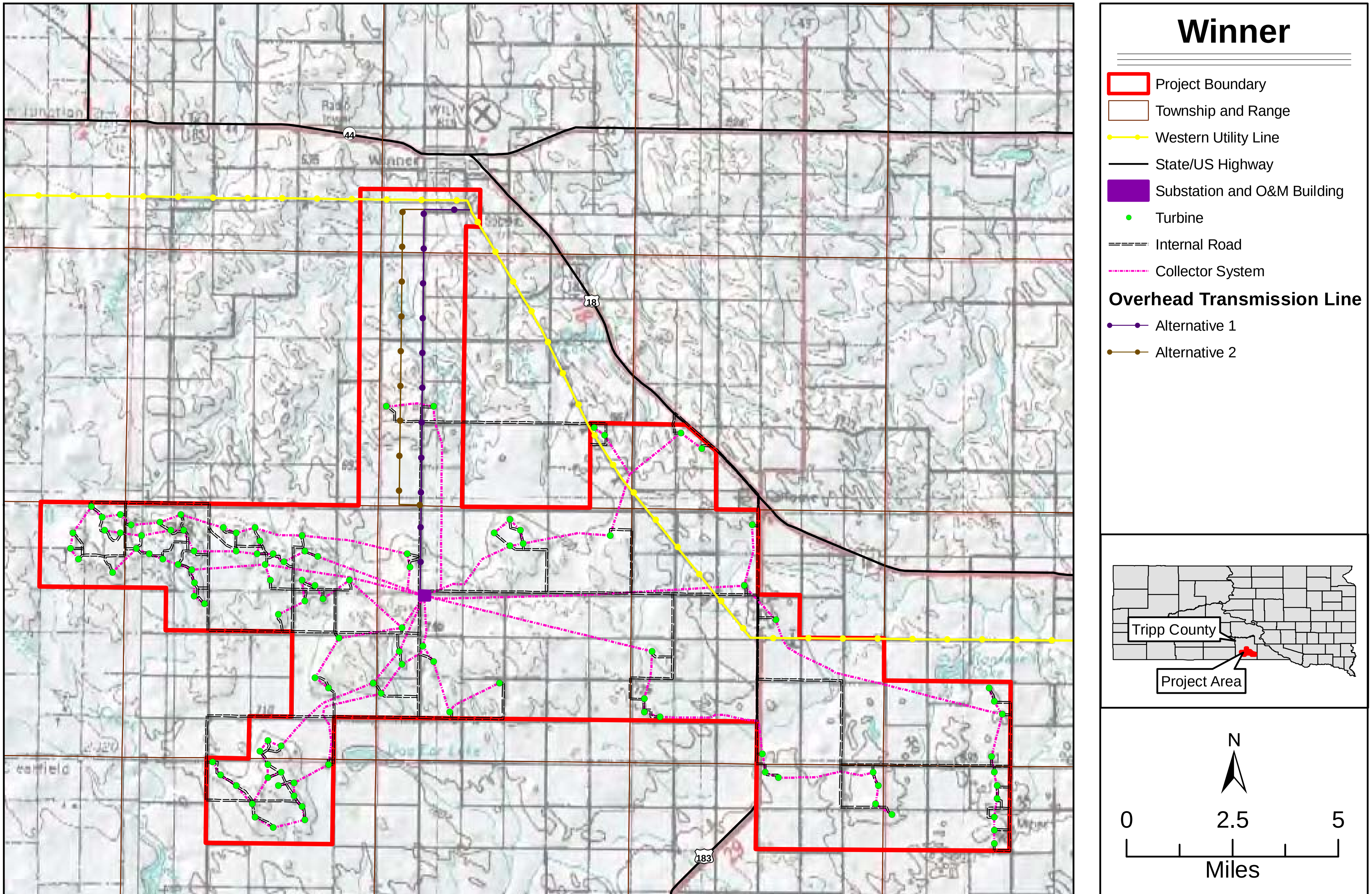
This section describes the Federal agency actions as well as the purpose and need for the Proposed Project. The Proposed Project is subject to the jurisdiction of the South Dakota Public Utilities Commission (SDPUC), which has regulatory authority for siting wind generation facilities and transmission lines within the State. The Applicants will submit an application for an Energy Conversion Facility Permit to the SDPUC. The SDPUC permit would be needed to authorize the Applicants to construct the Proposed Project under South Dakota rules and regulations.

1.2.1 WESTERN INTERCONNECTION

The Applicants propose to interconnect its Proposed Project with either Western's Winner or Wessington Springs Substation. Western's purpose and need is to respond to the interconnection request in accordance with Section 211 of the Federal Power Act and Western's Open Access Transmission Service Tariff (Tariff). Section 211 of the Federal Power Act requires that transmission service be provided upon request, if transmission capacity is available.

Western's Tariff provides open access to its transmission system. If there is available capacity in the transmission system, Western provides transmission services through an interconnection. This interconnection request requires Federal action which triggers NEPA review. When responding to the need for agency action, and subject to its NEPA review, Western is bound by the following:

- Providing Transmission Service - under Western's Tariff, Western offers capacity on its transmission system to deliver electricity when capacity is available. The Tariff complies with the Federal Energy Regulatory Commission's (FERC) Final Orders which are intended to ensure non-discriminatory transmission system access. Western submitted revisions to its non-jurisdictional Tariff in January 2005 as to certain terms and for inclusion of the Large Generator Interconnection Procedures (LGIP) and a Large Generator Interconnection Agreement (LGIA). Final approval for that filing was received from FERC in September 2007. In March 2007, Western submitted another revision for certain terms and to incorporate the Small Generator Interconnection Procedures (SGIP) and a Small Generator Interconnection Agreement (SGIA). In September 2009 Western submitted yet another set of revisions to address FERC Order 890 requirements along with revisions to existing terms.



SDPW Project

Figure 1.4

Date: 06.03.09	Infrastructure	Author: JAG

G:\Data\Basin\Maps\EIS\Winner\Winner_Infrastructure

- Protecting Transmission System Reliability and Service to Existing Customers - Western must ensure that existing reliability and service is not degraded. Western's LGIP provides for transmission and system studies to ensure that system reliability and service to existing customers are not adversely affected by new interconnections. These studies also identify system upgrades or additions necessary to accommodate the proposed Project and ensure that they are in the project scope.

1.2.2 RUS FINANCING

RUS is authorized to make loans and loan guarantees that finance the construction of electric distribution, transmission and generation facilities, including system improvements and replacements required to furnish and improve electric service in rural areas, as well as demand side management, energy conservation programs, and on-grid and off-grid renewable energy systems.

PrairieWinds has requested financial assistance for the Proposed Project from RUS. RUS's proposed Federal action is to decide whether to provide financial assistance; accordingly, completing the NEPA review process is one requirement, along with other technical and financial considerations in processing PrairieWinds' application.

The Rural Electrification Act of 1936, as amended, (7 U.S. Code [U.S.C.] 901 *et seq*.) (RE Act) generally authorizes the Secretary of Agriculture to make rural electrification and telephone loans, including specifying eligible borrowers, preferences, purposes, terms and conditions, security and self-liquidation requirements. The RE Act also authorizes the Secretary of Agriculture to assist borrowers that implement conservation and renewable energy programs.

RUS's agency action involves:

- Provide engineering reviews of the purpose and need, engineering feasibility and cost of the Proposed Project
- Ensure that the Proposed Project meets the borrower's requirements and prudent utility practices
- Evaluate the financial ability of the borrower to repay its potential financial obligation to RUS
- Review and study the alternatives to mitigate and improve transmission reliability issues
- Ensure that adequate transmission service and capacity are available to meet the Proposed Project needs
- Ensure that NEPA and other requirements and RUS Environmental Policies and Procedures are satisfied prior to taking a Federal action

1.2.3 COOPERATING AGENCIES

Two agencies, Wessington Springs Area Development Corporation and USFWS, expressed interest in participating as cooperating agencies. Wessington Springs Area Development Corporation is a non-profit non-governmental organization and will participate as an interested party, as prescribed in the CEQ Memorandum for the Heads of Federal Agencies (CEQ 2002), and will be engaged in the NEPA process and on distribution lists for review and comment on the NEPA documents. As of May 13, 2009, the USFWS has formally accepted to participate as a cooperating agency. All agencies, regardless of cooperating agency status, will be kept informed of the Proposed Project and receive updates as they become available.

The USFWS is a Federal agency whose primary responsibility is working with others to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people. The proposed development sites are located within two USFWS Wetland Management District (WMD) administrative boundaries. The Huron and Lake Andes WMDs are responsible for addressing the potential impacts to USFWS lands within the Proposed Project area.

Additionally, the USFWS works with agencies and other partners to conserve wetlands, migratory birds and Federally-listed threatened/endangered wildlife by administering the Fish and Wildlife Coordination Act, Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712), Bald and Golden Eagle Protection Act of 1940 (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250), and the ESA (7 U.S.C. 136; 16 U.S.C. 460 *et seq.*).

The leased private land within the proposed wind farm sites could include lands encumbered by perpetual easements administered by the USFWS. These conservation easements are minimally restrictive instruments that grant the USFWS the ability to protect the grassland and wetland habitat on these properties. Easements are acquired as an alternative to fee-title acquisition and are administered as part of the National Wildlife Refuge System to perpetually protect grasslands and wetlands to benefit migratory birds and other wildlife. While easements are particular areas of concern, potential long-term impacts to wildlife and habitat resources can occur on any lands. Thus, the USFWS will be actively involved in the review of the proposed wind turbine sites to identify and offset impacts to USFWS interests and trust resources throughout the project area. When the final location is chosen, and micro-siting of facilities begins, additional coordination will be pursued with the USFWS.

1.2.4 APPLICANTS' PURPOSE AND NEED

PrairieWinds is a wholly-owned subsidiary of Basin Electric. PrairieWinds proposes to construct, own, operate and maintain the Proposed Project.

Project Purpose

Basin Electric is a consumer-owned, regional cooperative headquartered in Bismarck, North Dakota, which services more than 120 member rural electric systems in nine States: Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota and Wyoming. These member systems, in turn, distribute electricity to more than 2.8 million customers.

Public policy regarding the electric industry has increasingly focused on the carbon intensity of the resources commonly used to generate electricity. As a result, incentives and regulations to encourage or require the generation of power from renewable resources are being actively considered and/or implemented within the Basin Electric member service areas. At the same time, a number of proposals for national Renewable Portfolio Standards (RPS) are pending in Congress. With members in nine States, Basin Electric recognizes the need for additional renewable energy capacity to service forecasted member load growth demands and to meet State-mandated RPS.

Basin Electric membership passed a resolution at their 2005 annual meeting that established a goal to "obtain renewable or environmentally benign resources equal to 10 percent of the MW capacity needed to meet its member demand by 2010." This project would provide an opportunity for them to meet that goal.

State Renewable Energy Objectives

Several States within Basin Electric's service territory, including Colorado, Minnesota, Montana, North Dakota and South Dakota, have adopted Renewable Energy Objectives (REOs) that require renewable generation to meet a certain percentage of retail sales. The REOs adopted in the various States include both mandatory and voluntary goals that range from 10 to 25 percent of energy production to be generated or procured from an eligible energy technology by a specified deadline. Deadlines for compliance range from 2015 to 2025.

The State of South Dakota has a voluntary 10 percent by 2015 REO. An assumption of 1.25 percent by 2008, 2.5 percent by 2009, 3.75 percent by 2010, 5 percent by 2011, 6.25 percent by 2012, 7.5 percent by 2013, 8.75 percent by 2014 and 10 percent by 2015 was used to meet the REO. Basin Electric serves member cooperatives including East River, Grand, Rosebud and Rushmore.

Basin Electric's Renewable Energy Sources

Basin Electric captures approximately 22 MW of recovered energy generation (heat recovery from pipeline compressors) from four sites. Four additional sites, another 22 MW of electricity, are expected to be available by late 2009. The total wind generation owned by Basin Electric is projected to be 125.2 MW by late 2009; and the wind energy purchased is 131 MW, making the total wind generation (owned and purchased) available to Basin Electric's members 256.2 MW by late 2009.

Basin Electric would need a total of 272 MW of renewable capacity, which is 10 percent of the 2,721 MW of forecasted member load for the year 2010, to meet its goal. With the addition of 151.5 MW for the Proposed Project, they will be able to meet the REO requirements for those States that currently have such requirements through the year 2016. **Figure 1.5** compares the needed renewable generation to the existing and proposed renewable generation.

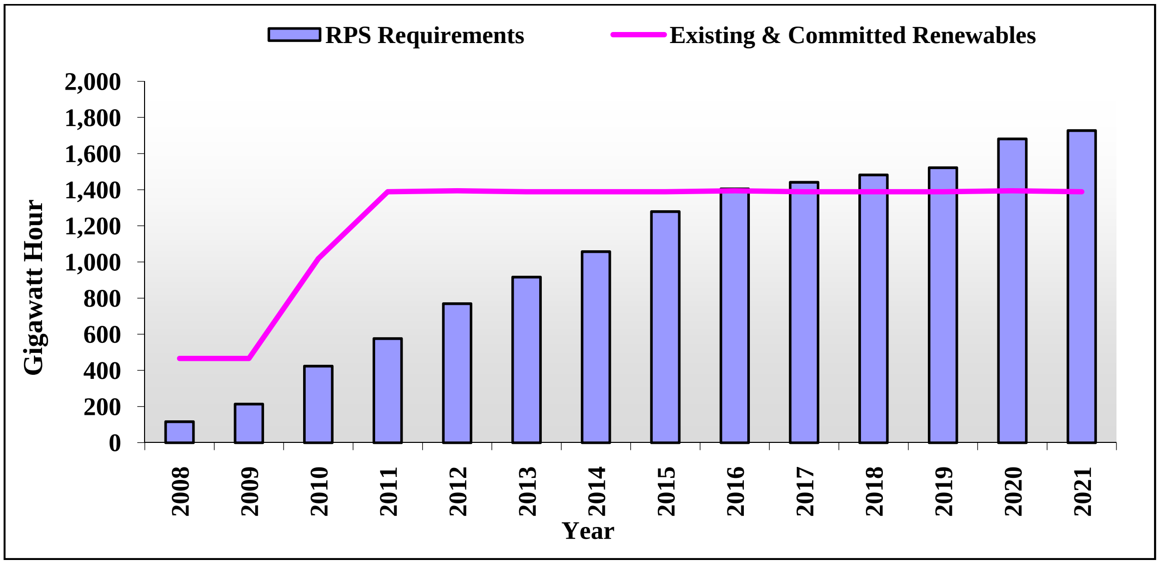


Figure 1.5 RPS Requirements and Existing/Proposed Renewable Energy Sources

Existing Resources

According to its 2007 Power Supply Analysis (PSA), Basin Electric operates a total of 3,518 MW of electric generating capacity and has a total of 136 MW of wind energy resources in the form of owned projects and power purchase agreements; additionally, Basin Electric has 22 MW of recovered energy generation through power purchase agreements. Basin Electric also manages and maintains 2,424 miles of high-voltage transmission lines, 40 switchyards and substations, and 58 microwave installations used for communications and system protection.

Projected Energy Requirements

Between 1999 and 2006, Basin Electric's system peak demand increased 752 MW, from 1,195 MW to 1,947 MW, which is approximately 107 MW per year. Their system energy sales increased 5.3 million megawatt-hours (MWh), from 6.5 million MWh to 11.8 million MWh, or approximately 760,000 MWh per year. Basin Electric forecasts peak demand on its system to grow by 1,834 MW from 2006 through 2021. This will be a growth of approximately 122 MW per year. The load growth is driven mainly by commercial sector growth, which includes energy related development in the form of coal, oil and gas development. There are also increased loads in the residential sector mainly located on the outskirts of larger cities within the service territory. This is depicted in **Figure 1.6**.

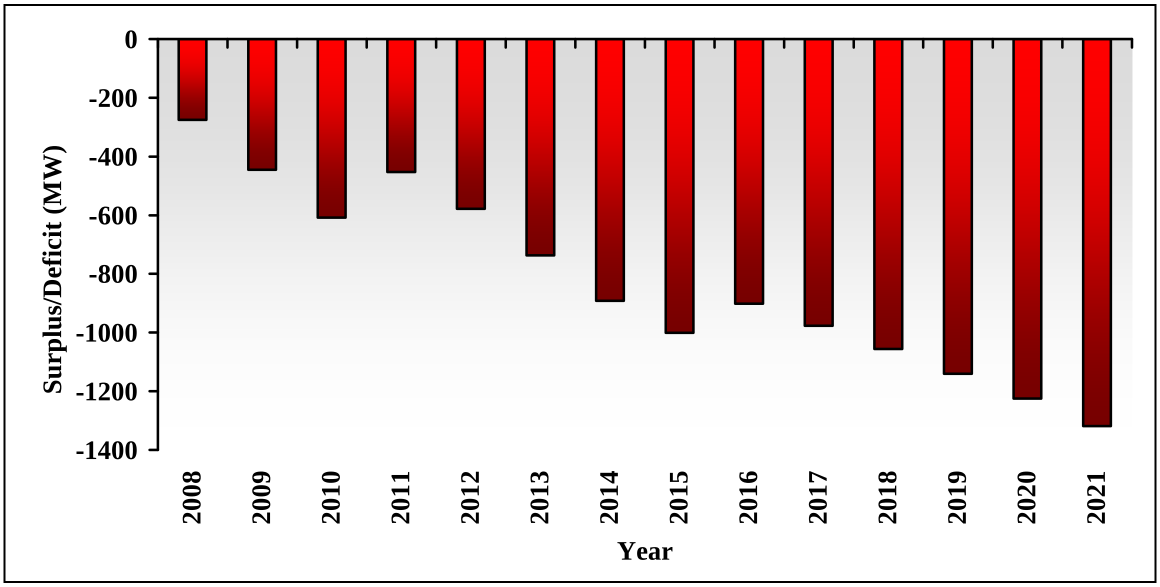


Figure 1.6 Total System Load and Capability

Basin Electric's total system deficit was anticipated to be 275 MW in 2008 and is forecasted to increase steadily over time. As **Figure 1.6** depicts, the deficit is anticipated to decrease in 2011 from 2010 levels when the new Dry Fork Station in Wyoming is expected to go commercial; the deficit is also anticipated to decline slightly in 2016 when Basin Electric's long-term power supply obligation ends.

Project Need

The need has been established for additional renewable energy capacity in the PSA to serve forecasted member load growth demands, to meet Basin Electric's renewable energy goal set forth in 2005, and to meet State mandated RPS. Solar resources in the region are limited. While solar economics are improving, costs are still not competitive with wind. Geothermal and bio-based resources are, in some cases, cost effective but are restricted to limited or distant locations, available only in small quantities, or present other environmental concerns. In contrast, potential wind resources in the Basin Electric member service territory are generally recognized as excellent, and limited mainly by land use and transmission. The proposed wind project was determined to be the best available, least-cost renewable resource option to satisfy future load and RPS requirements.

1.3 REGULATORY FRAMEWORK AND LAND STATUS

The Proposed Project must comply with Federal, State and local laws requiring permits or approvals. **Table 1.1** lists agencies and their respective permit/authorizing responsibilities with respect to the Proposed Project.

In addition to complying with Federal, State and local laws requiring permits or approvals, the Applicants also coordinated with private land owners for lease agreements. All lands considered for the Proposed Projects are privately owned parcels. This could include lands encumbered by

Table 1.1 Regulatory Compliance, Potential Permits and Approvals for the Construction and Operation of the Proposed Project

Agency	Type of Approval	Description
Federal Approvals		
U.S. Environmental Protection Agency (EPA)	Spill Prevention Control and Countermeasures (SPCC) Plan	SPCC Plans are required for non-transportation facilities that have a total above-ground oil storage capacity of 1,320-gallons.
Federal Aviation Administration (FAA)	Form 7460-1. Notice of Proposed Construction	Notice and approval are required for structures over 200 feet in height. FAA approval of lighting and marking of turbines is required.
U.S. Army Corp of Engineers (USACE)	Section 404 Clean Water Act (CWA) Permit	If wetlands would be impacted, a permit for placement of fill would be required. Further investigation is required to determine USACE jurisdiction within the project area.
USFWS	MBTA, Section 7 of ESA, BGEPA	Special status species protection.
USFWS	Special Use Permit (SUP), Right-of-Way Permit, Compatibility Analysis of Disturbed Easements	If constructing in wetland or grassland easements, then a permit or analysis is required for temporary disturbance.
Western, RUS, State Historic Preservation Office (SHPO)	Section 106 of NHPA	Cultural resources protection.
Western, RUS	Native American Graves Protection and Repatriation Act (NAGPRA)	Cultural resources protection.
State of South Dakota		
Department of Environment and Natural Resources (DENR)	Section 401, CWA	State requirement for Water Quality Certification.
DENR	National Pollutant Discharge Elimination System (NPDES), General Construction Storm Water Water Rights Permit	Required for disturbance of over 1 acre of land. Must prepare a Storm Water Pollution Prevention Plan (SWPPP).
South Dakota Game, Fish and Parks (SDGFP)	State Threatened and Endangered Species List	Special status species protection.
SDPUC	Energy Facility Site Permit	Required for construction of generation facility.
South Dakota Department of Transportation (SDDOT)	Oversize/Overweight Permit	Permit required for hauling construction equipment and materials on State highways.
SDDOT	Road Approach/Access Permit	Permits required for construction to of access roads to connect to a State highways.
SDDOT	Utility Crossing Permit	Permit required for utility crossings on State highway right-of-way.
SDDOT	Aeronautical Hazard Permit	Permit lighting plan determined with FAA coordination.
Local Permits		
Brule, Aurora, Jerauld and Tripp Counties	Zoning, conditional use authorization and related building permits	Permits required for project construction.
Brule, Aurora, Jerauld and Tripp Counties	Road Approach/Access permits	Permits required for project construction.
Brule, Aurora, Jerauld and Tripp Counties	Soil Erosion and Sediment Control Plan	Permits required for project construction.

perpetual easements administered by the USFWS, which are acquired as an alternative to fee-title acquisition and are administered as part of the National Wildlife Refuge System. The Applicants have entered into up-to 50-year lease agreements for placement of the wind turbine generators and associated infrastructure with private landowners within the Proposed Project areas. The Applicants would negotiate in good faith to enter into a new lease agreement upon commercially reasonable terms and conditions to replace the lease agreement at the end of the 50-year agreement. The decision to renew the leases versus decommissioning the facility would be made at that time based on market conditions. Depending on current wind turbine technology, at the end of the lease period, the wind turbine generators may be updated with more efficient components, thereby, extending the wind turbine generator service life.

1.4 PUBLIC INVOLVEMENT / SCOPING

As part of the NEPA process, public participation is a way to inform the public about activities that involve a Federal action and solicit input regarding the proposed project. Western and RUS utilized input identified through public participation to assist with the development of the scope, content and alternatives analysis for the EIS. By incorporating public participation into the development of the EIS, Western, RUS and USFWS will be able to make a more informed decision on their respective proposed actions.

The CEQ, DOE and RUS NEPA regulations define scoping as an early and open process for determining the scope of issues to be addressed in an EIS and for identifying input related to the proposed project. Western and RUS invited Federal, State, local and tribal governments, the Applicants, and other interested persons and groups to participate in defining the scope of the EIS. The public participation process also satisfies the requirements under Section 106 for government-to-government consultation and invited the tribes to participate in reviews conducted under NEPA and Section 106 of the NHPA.

Western and RUS employed various methods to provide information to the public and solicit input regarding the Proposed Project. Information was included in direct mailings that were sent to over 4,000 potentially interested persons in and near the project area. Venues for participation included two scoping meetings and one interagency meeting. In addition to receiving comments at meetings, the Agencies invited interested individuals to submit written comments via mail, fax, e-mail and/or the project website. Additional future public participation opportunities will include project update mailings, review and comment on the DEIS and at least one public hearing. The information in the following sections summarizes the input that has been received on the Proposed Project through the end of the scoping process. Copies of the notices and meeting materials are included in **Appendix A** of this report.

1.4.1 NOTICE OF INTENT

The “Notice of Intent to Prepare an Environmental Impact Statement and to Conduct Scoping Meetings; Notice of Floodplains and Wetland Involvement” was published in the *Federal Register* (FR) (74 FR 15718) on April 7, 2009. The Notice of Intent (NOI) included information on the Proposed Project, agency actions, times and locations for the April 28 and April 29, 2009, scoping meetings and contact information for questions pertaining to the Proposed Project.

1.4.2 NEWSPAPER NOTICES

Notices announcing the public scoping meetings were published in *Indian Country Today*, *Mitchell Daily Republic*, *Plankinton South Dakota Mail* and the *Winner Advocate*. *Indian Country Today* is a national, Native American interest publication, while the others are local newspapers. Advertisement publications in each newspaper provided information on the proposed project, scoping meeting information and contact information for questions pertaining to the proposed project. The second notice publication in *Indian Country Today*, *Mitchell Daily Republic* and *Winner Advocate*, provided the same information as the initial announcements.

The scoping meeting notice was published as follows:

- *Indian Country Today* – April 8 and 22, 2009
- *Mitchell Daily Republic* – April 8 and 22, 2009
- *Plankinton South Dakota Mail* – April 23, 2009
- *Winner Advocate* – April 8 and 22, 2009

1.4.3 DIRECT MAILINGS

In addition to the NOI, Western and RUS mailed postcard scoping notices and letters, which included the scoping meeting information, to over 4,000 potentially interested persons. The mailing list included Federal, State and local agencies; elected officials; Native American tribes; members of the public; and addresses within seven miles of the Proposed Project alternatives.

The postcard scoping notice was mailed on April 6, 2009. This postcard mailing provided information on the Proposed Project; details for the April 28 and April 29, 2009 scoping meetings; and contact information for questions pertaining to the Proposed Project and/or the NEPA process.

In addition to the postcard scoping mailings, a letter was sent to more than 15 Native American tribes (tribes, communities and representative councils) on April 13, 2009, providing information on the Proposed Project, EIS scoping meeting details and contact information for questions pertaining to the Proposed Project. The letter also served to initiate government-to-government consultation and invited the tribes to participate in the reviews conducted under NEPA and Section 106 of the NHPA.

1.4.4 SCOPING MEETINGS

Two scoping meetings were hosted by Western and RUS during the public scoping process. The scoping meetings were held using an open-house format to allow for an informal one-on-one exchange of information. Scoping meeting handouts included a copy of the NOI, project fact sheet, scoping process information sheet, comment form and a DOE NEPA brochure. Large-scale aerial photographs illustrating the Proposed Project alternatives were available to help facilitate identification of issues and alternatives. Additional large-scale poster boards included: a South Dakota wind resource map, an EIS process and timeline graphic, the agencies' Federal Action boards, and turbine and transmission line siting parameters. A station was set up at the meetings with a looping PowerPoint presentation to provide an opportunity for individuals to sit and view Proposed Project information and follow along with a print out of the presentation slides. The same information was available at each meeting. All information presented at the meetings is available on Western's website: http://www.wapa.gov/transmission/sdprairiewinds.htm.

Table 1.2 lists the scoping meeting locations, dates, times and attendance.

Table 1.2 Public Scoping Meetings

Location	Date	Time	Attendance
Winner, SD	April 28, 2009	4 - 7 p.m.	88
Plankinton, SD	April 29, 2009	4 - 7 p.m.	81
Total			**169**

1.4.5 INTERAGENCY MEETING

A letter was sent on April 9, 2009, to invite Federal, State and local agencies to participate in an interagency meeting for the EIS. In addition, agencies with jurisdiction or special expertise were requested to be a cooperating agency for the Proposed Project.

On April 28, 2009, Western and RUS hosted an interagency meeting at the Best Western Ramkota Hotel, in Pierre, South Dakota, from 9 a.m. to 11 a.m. Proposed Project-specific information was presented at the meeting. The following list summarizes the agencies represented at the interagency meeting (in alphabetical order):

- Aurora County Weed Supervisor
- Bureau of Indian Affairs (BIA)
- Intertribal Council on Utility Policy (Intertribal COUP)
- Mayor of Wessington Springs, South Dakota
- South Dakota Aeronautics Commission
- South Dakota DENR
- SDGFP
- South Dakota Governor's Office
- SDPUC
- SHPO
- South Dakota State Land Department
- USACE
- USFWS
- Wessington Springs Area Development Corporation

1.5 COMMENT SUMMARY

A summary of the written comments received and issues identified through May 15, 2009, are included in **Table 1.3** (note that similar items have been grouped together). Overall, 16 comment forms were received during the scoping and interagency meetings, 46 comment forms/letters were mailed in, 14 comments were e-mailed to the project e-mail address, and one faxed comment was received.

Table 1.3 Scoping Comment Summary

Issue	Comment	Treatment / Response
Air quality	Protection of air quality should be addressed.	Comment will be addressed in the EIS.
	Dust particulates from construction and on-going project activities are a concern; EIS should include dust control methods.	Comment will be addressed in the EIS.
Alternatives	Preference for the proposed Crow Lake Alternative to be approved for the Proposed Project.	Comment noted.
	Preference for Crow Lake Alternative to be approved for the Proposed Project; also noted that site may cost less to build due to smaller acreage, and have higher wind potential.	Comment noted.
	Map request of the Crow Lake Alternative.	Map was provided.
	Summarize criteria and process used to develop Proposed Project alternatives, disclose reasoning used to eliminate alternatives.	Comment will be addressed in the EIS.
	Proposed Project alternatives map request.	Map was provided.
Aviation safety	Request for all project turbines to be lit at night as mitigation.	Comment will be addressed in the EIS.
Biological resources	USFWS formally accepted invitation to participate as a cooperating agency.	Cooperating agency status confirmed.
	USFWS provided a list of Federally-protected species that may occur in the project area(s).	Species impact analysis will be provided in the EIS.
	USFWS provided wind turbine guidelines and considerations for meteorological towers and power lines with respect to sensitive species.	Comment will be addressed in the EIS.
	USFWS provided discussion on wind energy and wildlife.	Comment noted.
	USFWS provided information on avian and bat protection plans, including the MBTA, or BGEPA, and information on birds of conservation concern, and U.S. Geological Survey avian research.	Avian and bat impact analysis will be provided in the EIS.
	South Dakota Game, Fish, and Parks (SDGFP) supports development of alternative sources of energy.	Comment noted.
	SDGFP suggested considering impacts, including mortality, from turbine strikes, habitat alteration, and behavior modification from improperly sited wind power projects.	Avian and bat impact analysis will be provided in the EIS.
	SDGFP noted previous correspondence with project representatives and information provided including SDGFP Natural Heritage Program data and information on unique and/or special resources or areas in the Proposed Project areas.	Comment noted; species impact analysis will be provided in the EIS.
	Identify endangered species potentially affected by the project.	Endangered species impact analysis to be included in the EIS.
	Disclose and evaluate effects of project activities on area ecology, vegetation, and wildlife and habitats.	Comment will be addressed in the EIS.
	Identify critical habitat and impacts on species and critical habitat.	Comment will be addressed in the EIS.
	Describe how project will meet ESA requirements.	Comment will be addressed in the EIS.
	Analyze migration corridors and flyways.	Comment will be addressed in the EIS.
	Disclose potential toxic hazards associated with pesticide or herbicide use.	Comment will be addressed in the EIS.

Table 1.3 Scoping Comment Summary

Issue	Comment	Treatment / Response
Cultural resources	Identify potential cultural impacts.	Follow-up discussion with the commenter was conducted by project representatives. Comment will also be addressed in the EIS.
Cumulative impacts	EIS should examine cumulative impacts, including direct and indirect effects, including past, present, and reasonably foreseeable future activities.	Comment will be addressed in the EIS.
Environmental Justice	Include potential impacts on low income, minority, and/or tribal communities.	Comment will be addressed in the EIS.
Greenhouse gases and climate change	The EIS should include an estimate of annual greenhouse gas emissions expected during operations and describe the emissions in terms of carbon dioxide (CO_2) equivalents in metric tons per year per MW hour produced; then compare to regional or State estimated emissions.	Comment will be addressed in the EIS.
NEPA process	Request that the environmental process be expedited.	Comment noted.
	National energy policies and national security in general are impacted by excessive oil import.	Comment noted.
	Commented that wind and other renewable projects are time sensitive, and should be implemented more quickly.	Comment noted.
	Support for wind energy development; noted that USFWS is an impediment to wind development; compliance with the USFWS approval process is a moving target and should be more easily acquired for wind energy projects.	Comment noted.
	Request to be added to project mailing list.	Information added to mailing list.
	Welcomed project representatives to the City of White Lake.	Comment noted.
	Provided encouragement for the project to move forward.	Comment noted.
	Representative from KWYR requested radio interview.	Follow-up discussion with the commenter was conducted by project representative.
Out of scope	Other developers have prompted individuals to sign land agreements. Commenter requested clarification on right-of-way details and easement compliance, requested information on land agreement expirations and payment guarantees.	Applicant responded to commenter.
	Encouraged upgrading transmission lines through the areas to provide power access for other wind farm projects interested in the area.	Comment noted; the project as proposed is to build a wind-powered electric generation facility in central South Dakota, as such this comment is beyond the scope of this EIS.
	Request for transmission line upgrades in Gregory County to support wind energy development.	Comment noted; the project as proposed is to build a wind-powered electric generation facility in central South Dakota (not within Gregory County), as such this comment is beyond the scope of this EIS.
	Interest in supplying services/facilities during construction of the project.	Comment noted; information provided to Applicant.
	Volunteered land for wind turbine development.	Comment noted; information provided to Applicant.

Table 1.3 Scoping Comment Summary

Issue	Comment	Treatment / Response
Out of scope *(continued)*	Supports Proposed Project, and suggests improving local transmission infrastructure.	Comment noted. The project as proposed is to build a wind-powered electric generation facility in central South Dakota; as such this comment is beyond the scope of this EIS.
Project description	Request for information on the size, and height of the wind testers, number of testing sites in the study areas, acres of study areas, size and MW of proposed substation.	Much of this information was available in the scoping meeting materials and on the project website. Follow-up discussion with the commenter was conducted by project representatives. Comment will also be addressed in the EIS.
	Include construction, design, and operation practices that will be incorporated to protect water quality from erosion.	Comment will be addressed in the EIS.
	Inquired about the substation component of the Proposed Project.	Comment noted. Substation information can also be found in the NOI and will be included in the EIS.
Scoping	Welcomed the Proposed Project and was pleased with the presentation during the meetings.	Comment noted.
	Request project information.	Follow-up e-mail provided project information.
	Support for the Proposed Project, and would have preferred a formal presentation during the scoping meeting.	Comment noted; follow-up phone call with the commenter was conducted by project representatives.
	Bureau of Land Management (BLM) appreciates the opportunity to review and provide comments on the project, but that the agency does not have expertise or information relevant to the project.	Comment noted.
	Appreciated the meeting, found it interesting.	Comment noted.
	South Dakota Mail representative requested scoping meeting notice to be included in the local newspaper.	Comment noted and notice was included in *South Dakota Mail.*
	Request information regarding the scoping meetings.	Comment noted, information provided.
Section 106 process	Are government agencies participating in Government-to-Government discussions with local Native American Tribes?	Follow-up discussion with the commenter was conducted by project representatives. Comment noted; the lead agencies have initiated the Government-to-Government consultations.
	Concern about notification to tribes regarding the scoping meetings.	Tribes were notified of the EIS scoping meetings in a letter dated April 13, 2009; Government-to-Government consultation will continue through the Section 106 process; tribal meetings began in August 2009.
	Northern Arapahoe Tribal Consultants offered archaeological services for the Proposed Project EIS analysis and Section 106.	Comment noted.

Table 1.3 Scoping Comment Summary

Issue	Comment	Treatment / Response
Visual resources	Provided information on the Lewis and Clark National Historic Trail (NHT); requested that the EIS include analysis of the potential visual resource effects for both the Proposed Project alternatives in regards to the Lewis and Clark NHT.	Comment will be addressed in the EIS.
Water resources	Clearly describe water bodies within the analysis area which may be impacted by project activities; analysis of area's geology, topography, soils and stream stability may be necessary.	Comment will be addressed in the EIS.
	Provide information on Clean Water Act (CWA) Section 303(d) impaired waters in project area, if any.	Comment will be addressed in the EIS.
Wetlands / riparian areas	Identify potential wetlands both jurisdictional and non-jurisdictional, potential impacts, and least damaging practicable alternative for avoiding wetlands.	Comment will be addressed in the EIS.

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2 Alternatives and Proposed Federal Actions

This chapter describes the Proposed Project and proposed Federal actions, and in addition, the Applicants' site selection and screening methods. These methods were used to determine which alternatives would be carried forward for analysis. This chapter provides detailed descriptions of the Crow Lake and Winner alternatives, Proposed Project facilities, construction, operation, and decommissioning activities. It also describes the No Action Alternative, and provides a summary of impacts by alternative. There were no additional alternatives identified during scoping but eliminated from further analysis as part of this NEPA process.

Proposed Federal Actions

The proposed Federal actions evaluated in this EIS by each of the involved Federal agencies are specific and limited and are based on the purpose and need for agency action as described in Section 1.2. Western and RUS need to make decisions as follows:

Western: Western's proposed action is to approve Basin Electric's interconnection to Western's transmission system at either Wessington Springs Substation or Winner Substation, an action which requires Western to complete modifications to one of these substations to support the interconnection.

RUS: PrairieWinds has requested financial assistance for the Proposed Project from RUS. RUS's Federal action is based on providing financial assistance; completing the EIS is one requirement, along with other technical and financial considerations in processing PrairieWinds' application.

Western System Modifications

Western proposes to modify its transmission system based on a preliminary review of the interconnection request. Western would need to add electrical equipment at the Wessington Springs Substation for the Crow Lake Alternative or Winner Substation for the Winner Alternative. Depending on additional transmission studies and electrical design work, the additional electrical equipment would, at a minimum, include installing new concrete foundations, substation bus work, cable trenches, buried cable grounding grid, and replacing existing equipment and/or conductors to accommodate the interconnection. Pending additional study and approval from Western, the Winner Alternative may require expansion of the Winner Substation for the transmission interconnection. Western would design, own, construct, and operate any additions and modifications at these substations. Because Western is a Federal agency, Western is not ceding any jurisdictional authority over Federal facilities to the State of South Dakota for the interconnection.

At this time, all the transmission system studies have not been completed. Details, requirements, and environmental impacts for other system improvements are unknown at this time, since they would be dictated by the on-going transmission system studies. These studies may identify additional upgrades needed to accommodate the proposed interconnection, including modifications at other existing Western substations that could include installing new control buildings; new circuit breakers and controls; adding new electrical equipment, which would include installing new concrete foundations for electrical equipment and buildings, substation bus work, cable trenches, buried cable grounding grid, and new surface grounding material; and/or replacing existing equipment and/or conductors with new equipment and/or conductors to accommodate the proposed interconnection.

If any needed transmission system modifications are not identified until after the completion of the Proposed Project EIS, Western and RUS would address the environmental impacts of these modifications in accordance with regulatory requirements.

2.1 APPLICANTS' SITE SELECTION AND SCREENING ANALYSIS

Prior to submitting the interconnection request and financing request, the Applicants conducted a screening process to analyze types of generation and possible alternatives. The *PrairieWinds – SD 1 Alternative Evaluation Analysis and Site Selection Study*, was completed in January of 2009. The following information summarizes the findings of the Applicants' study and how the proposed wind project of 151.5-MW was determined to be the best available, least-cost renewable resource option to satisfy future load and RPS requirements. As described in the study, the Applicants identified six alternative sites for consideration. The study analyzed the six alternatives and conducted a screening process to determine which sites had the ability to meet the purpose and need of the Proposed Project. Screening criteria included technical feasibility, economic viability (able to be implemented), and public issues and concerns.

The screening assessment also included consideration of the ability of alternatives to meet the Applicants' project objectives listed below:

- Meet current incentives/regulations that encourage or require power from renewable or low environmental impact resources
- Conform with proposals in Congress for national RPS
- Meet Basin Electric's need for additional energy capacity to serve forecasted growth demands
- Meet Basin Electric's need for additional renewable energy capacity to meet State-mandated RPS

The Applicant considered other factors in the evaluation of potential project sites, including topography, proximity to the interstate highway system, proximity of nearby population centers, and land parcel sizes. A site with rolling topography, rather than steep, rugged topography was preferred because of less turbulent airflow and ease of construction. Distance to the interstate highway system was also considered, due to the large transportation effort associated with the delivery of project components. A site with low population density, but near a population center, would allow site operation and maintenance staff access to a wider array of housing, schools, and services, thereby aiding in staff recruitment and retention. Finally, a site with larger landowner parcels would be preferred, since there would be a fewer number of leases and possible landowner conflicts.

To evaluate potential impacts to wildlife, a Potential Impact Index (PII) assessment was performed in general accordance with the USFWS Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines dated May 13, 2003 (2003 USFWS Guidance). The PII represents a "first cut" analysis of the suitability of sites proposed for development. It does so by estimating use of the site by selected wildlife species as an indicator of potential impact. Emphasis of the PII is on initial site evaluation and is intended to provide more objectivity than simple reconnaissance surveys.

Based on the results of the PII, the Reference Site (Lake Andes National Wildlife Refuge) had a total score of 331 compared to a total score of 269 for the Winner Site, 239 for the Crow Lake Site, and 214 for the Fox Ridge Site.

Table 2.1 summarizes the site selection and evaluation criteria for the each of the six sites evaluated as potential Proposed Project alternatives.

Through the alternatives screening process, the Applicants found that Crow Lake and Winner were the most favorable alternatives to meet their purpose and need of the Proposed Project. The Highmore/Ree Heights and Reliance alternatives were considered for elimination from further consideration since the land was leased by other developers. The Wessington Springs Alternative was eliminated from consideration due to proximity to multiple waterfowl production areas. When the Fox Ridge Alternative was investigated, transmission congestion and operating constraints on the regional transmission system were observed. The Applicants' thus found that the instability of the system created too high of a risk for the Fox Ridge Alternative to be feasible; the Fox Ridge Alternative was eliminated from further consideration. The remaining alternatives (Winner and Crow Lake) appeared favorable for development. **Figure 2-1** depicts the general locations of the Proposed Project alternatives.

2.1.1 CROW LAKE ALTERNATIVE

This area was identified as an excellent wind resource through the National Renewable Energy Laboratory (NREL) wind resource map (NREL 2009), supplemented by existing meteorological data from a site established by the South Dakota State University Wind Resource Assessment Network (WRAN) (WRAN 2008). Wind Logics, a meteorological consultant from Minneapolis, was contracted to develop a 500-meter wind map for the area, with the results indicating an excellent wind resource. Meteorological towers were assembled to measure the wind and correlation of this meteorological tower data with the WRAN site was initiated. In general, subsequent wind measurements for speed and direction are taken at different heights. These measurements confirm the site is a Class IV or better wind resource as defined by the U.S. DOE NREL.

Table 2.1 Site Selection and Evaluation Criteria

Site	Local Transmission Available	Additional Transmission Line Needed	Sufficient Land Available to Lease	Topography	Proximity to Interstate Highway System	Proximity to Population Center	Parcel Size
Highmore/ Ree Heights	Yes (Request Submitted)	10-12 Miles	Compromised by other developers	+	-	+	+
Wessington Springs	Yes	Not investigated	Wildlife Habitat	-	-	-	-
Reliance	Yes (Non-firm)	20+ Miles	Compromised by other developers	-	+	-	+
Fox Ridge	Yes (High Risk – weak regional transmission system)	5-6 Miles	Yes	-	-	-	+
Winner	Yes (Request Submitted)	5-6 Miles	Yes	-	-	+	-
Crow Lake	Yes (Request Submitted)	9-12 Miles	Yes	+	+	+	+

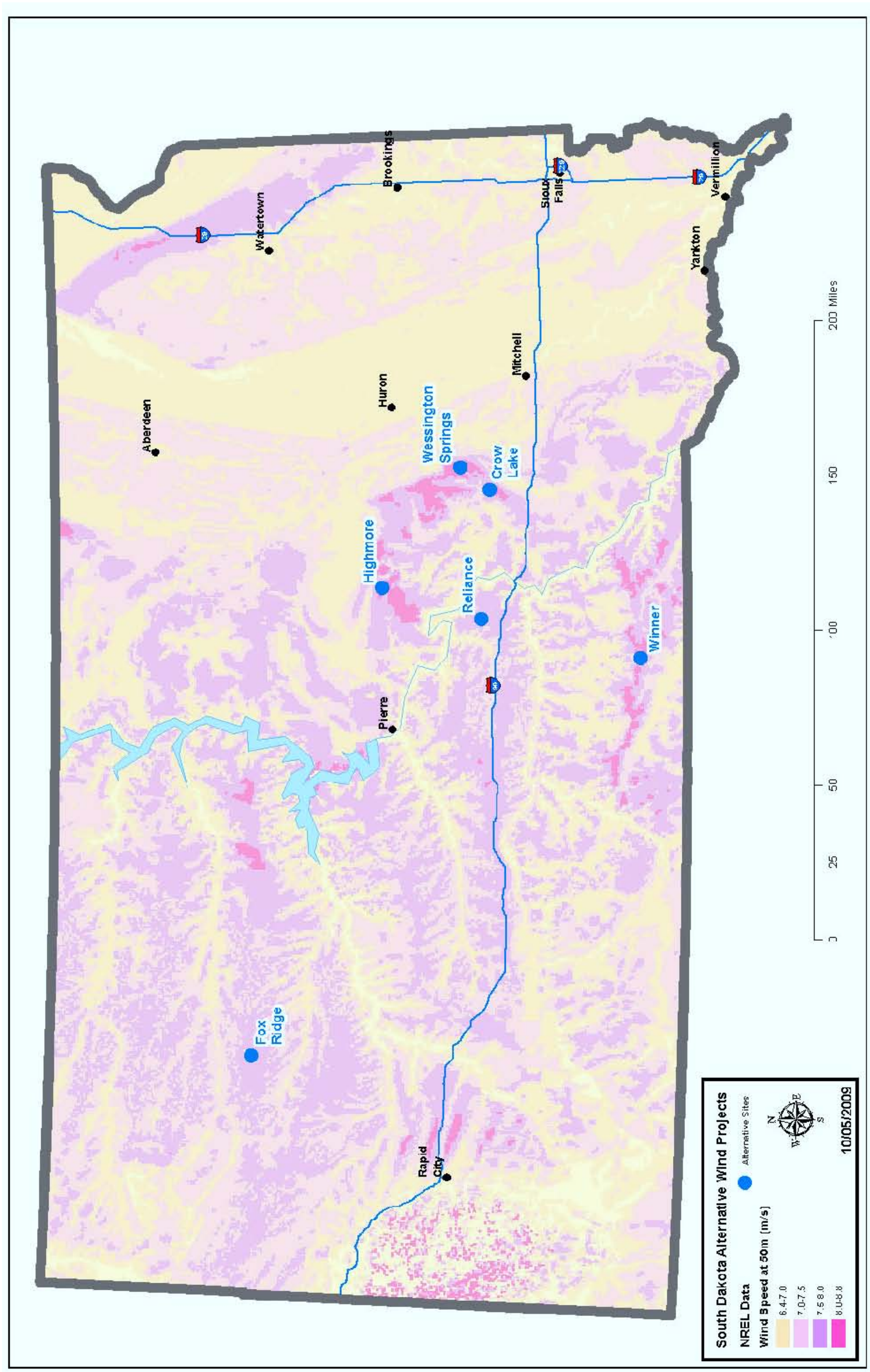

Figure 2.1 Locations of Sites Considered in Screening Assessment

The Applicants conducted environmental studies at the Crow Lake Alternative in late 2007. Various resources such as vegetation, water, wetlands, soils, wildlife, cultural and community issues were assessed to facilitate the evaluation of potential impacts. The Applicants noted that while there are potential issues that need to be addressed, it appears the site is viable for wind energy development. A PII was also done to better assess potential wildlife impacts.

2.1.2 WINNER ALTERNATIVE

This alternative, located in south-central South Dakota near the City of Winner, was identified as an excellent wind resource through the NREL wind resource map (NREL 2009). The Applicants' site reconnaissance also indicated good wind potential, with several ridges oriented somewhat transverse to the expected predominant wind direction. Subsequent wind mapping, using historical wind data provided additional confirmation of preliminary wind assessments, indicating this site has an excellent wind resource. Meteorological towers were installed to measure the wind for speed and direction taken at different heights. This data was correlated to the WRAN site to confirm the wind resource and assist in micro-siting (WRAN 2008).

The Applicants conducted environmental studies at the Winner Alternative in late 2008. Various resources such as vegetation, water, wetlands, soils, wildlife, cultural, and community issues were assessed to facilitate the evaluation of potential impacts. The Applicants noted that while there are potential issues that need to be addressed, it appears the site is also viable for wind energy development. A PII was also done to better assess potential wildlife impacts.

Western and RUS have reviewed the results of the Applicants' screening and siting studies. Based on this review and input received during the EIS scoping process, the Agencies fully analyzed the Crow Lake and Winner alternatives in the EIS.

2.1.3 APPLICANTS' PRELIMINARY SITING PARAMETERS

The following siting parameters were developed by the Applicants and were used in their micro-siting process for Crow Lake and Winner alternatives.

Preliminary siting parameters for turbine locations:

- Wind potential and topography
- Minimum distance of 400 feet from section lines or existing roads
- Minimum distance of 1,000 feet from occupied residences
- Minimum distance of 400 feet from existing transmission line
- Avoidance of wetlands and hydric soils areas
- Site near edges of USFWS grasslands easements to minimize impact
- 1,000 to 2,000-foot minimum distance between turbine locations within the predominant wind direction
- Avoidance of existing microwave paths
- FAA regulations and proximity to airports

- 1,320-foot minimum distance between turbine locations and USFWS Waterfowl Production Areas (WPA)

Preliminary siting parameters for transmission line locations:

- Minimize transmission line length
- Right-of-way requirements and availability of contiguous parcels of land
- Land use considerations (*i.e.,* potential visual impacts, proximity to residences, potential impact to agricultural activities and existing/future land use)
- Environmental resource considerations such as potential impacts to sensitive resources (*i.e.,* cultural resources, wildlife, vegetation and wetlands)
- Jurisdiction and regulatory considerations
- FAA regulations, military, weather and radar installations, and proximity to airports

2.2 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FULL ANALYSIS

Western and RUS reviewed the results of the Applicants' screening and siting studies (as discussed in **Section 2.1**) and concurred with the conclusion to eliminate the Highmore/Ree Heights, Wessington Springs, Reliance and Fox Ridge alternative sites from full analysis in the EIS.

Generally during the scoping process, any additional reasonable generation facility alternatives identified through comments received in response to the scoping process are considered. To be considered reasonable, alternatives would need to meet the Applicants' and Agencies' purpose and need, be technically feasible and economically viable. With publication of the NOI in the *Federal Register* (74 FR 15718) on April 7, 2009, interested parties were invited to participate in the scoping process. Aside from the Proposed Project alternatives (Crow Lake and Winner), no additional alternatives were identified during the scoping process.

For these reasons, only the Crow Lake and Winner alternatives are fully analyzed in this EIS.

2.3 CROW LAKE ALTERNATIVE

2.3.1 PROPOSED PROJECT COMPONENTS

The proposed Crow Lake Alternative would involve the installation and operation of a 151.5-MW nameplate capacity wind energy facility that would feature 101 wind turbine generators. Ten additional turbine locations were identified and analyzed in this DEIS. These turbines may be utilized as contingent turbine locations for the Proposed Project if specific turbine locations are eliminated as a result of additional resource surveys and engineering siting; or they may be installed within the selected site at a later date, pending future load, transmission availability, and renewable production standard requirements. The Crow Lake Alternative is located on approximately 37,000 acres approximately 15 miles north of the City of White Lake, South Dakota, within Brule, Aurora, and Jerauld counties.

The Proposed Project would be constructed within the boundaries of the site. The areas of disturbance would include the turbine generator foundations, operation and maintenance (O&M) building and fence perimeter, underground communication system and electrical collector lines (within the same trench), collector substation and microwave tower, overhead transmission line, temporary equipment/material storage or lay-down areas, crane walks, and new and/or upgraded service roads to access the facilities, (collectively termed the Proposed Project Components). A map depicting the Crow Lake Alternative is included in **Chapter 1 Figure 1-3**.

Temporary and permanent disturbance acreages for each of the Proposed Project Components are summarized in **Section 2.6** at the end of this chapter. **Table 2.4** provides a comparison of the Crow Lake Alternative and Winner Alternative estimated surface disturbances. The No Action Alternative would not result in any surface disturbances.

Turbines: The Applicants' plan to install 101 General Electric 1.5 super long extreme (sle) model wind turbines for the Proposed Project. Each wind turbine would have a nameplate capacity output of 1.5-MW of power, with a combined nameplate capacity of 151.5 MW. Each wind turbine would have a hub height of 262 feet (80 meters) and a wind turbine rotor diameter of 252 feet (77 meters). The total height of each wind turbine would be 389 feet (118.5 meters) with a blade in the vertical position. The wind turbine tower would be constructed of tubular steel, approximately 15 feet in diameter at the base, with internal flanges. The color of the towers and rotors would be standard white or off-white. **Figure B-1** in **Appendix B** provides a diagram of a General Electric 1.5sle wind turbine for the Proposed Project, and **Figure B-2** in **Appendix B** depicts the main components of a typical wind turbine. During construction, a work/staging area at each wind turbine would include the crane pad and rotor assembly area. This would temporarily disturb an area of approximately 500 feet by 500 feet; and permanently disturb a 25-foot radius around each turbine. The wind turbine foundations would typically be mat foundations or a concentric ring shell foundation. The excavated area for the wind turbine foundations would typically be approximately 70 feet by 70 feet. Pad mounted transformers would be placed next to each wind turbine, with the pedestal 17 feet in diameter, and crushed rock apron extending 10 feet wide around the pedestal. For step-and-touch voltage compliance, an area around each wind turbine and transformer would be covered in gravel four inches deep and ten feet in all directions. See **Figure B-3** in **Appendix B** for a depiction of a typical crane pad layout and **Figure B-4** in **Appendix B** for a depiction of a typical layout for a turbine apron plan.

Collector System: Each wind turbine would be interconnected with underground power and communication cables, called the collector system. The underground collector system would be placed in one trench or multiple parallel trenches within a 15-foot-wide corridor and connect each of the wind turbines to one central collector substation. The estimated trench length, including parallel trenches, is approximately 317,000 feet (60 miles). The communication system would be located within the same trenches. This trench would temporarily disturb the entire 15-

foot-wide corridor; it would not result in any permanent impacts. This system would be used to route the power from each wind turbine to a central collector substation where the electrical voltage would be increased from 34.5-kV to 230-kV. The collector substation would be enclosed in a fence with dimensions of roughly 350 feet by 140 feet, temporarily disturbing 10 acres and permanently disturbing 1.8 acres. **Figure B-5** in **Appendix B** shows the proposed Crow Lake Alternative collector substation layout and electrical bus arrangement.

Fiber Optic Communication Lines: The fiber optic communication lines for the Proposed Project would be installed in the same trenches as the underground electrical collector cables and connect each wind turbine to the O&M building and collector substation. There would be a small microwave tower within the substation fence. Using the Integrated Microwave Communication System, the facility would be able to communicate with the operations center.

O&M Building: It is anticipated that a 6,000-square-foot (55 feet by 110 feet) O&M building would be built in the vicinity of the collector substation, temporarily disturbing 20 acres, and permanently disturbing approximately one acre to accommodate personnel parking and the fence. The final location would be determined in consultation with future operations personnel.

Roads: New access roads would be built to facilitate construction and maintenance of the wind turbines. This road network would include approximately 75 miles of new or upgraded roads. These roads would be designed to minimize length and construction impact. The new and upgraded roads would temporarily disturb a corridor up to 40 feet wide to allow movement of wind turbine assembly cranes. Upon completion of construction, the wind turbine access roads would be narrowed to an extent allowing for the routine maintenance of the facility, anticipated to be a permanent 16-foot-wide corridor. Temporary portions of the access roads would be reclaimed.

Existing roads, State and county roads, and section line roads would be improved to aid in servicing the wind turbine sites. Approximately 30 to 40 miles of new wind turbine access roads would be built and 25 to 35 miles of existing roads would be used and where appropriate, improved. Private wind turbine access roads would be built to the towers. The specific wind turbine placement would determine the amount of private roadway needed.

Crane Walks: In some areas of the Proposed Project, it may be more efficient to move the wind-turbine-assembly crane cross-country, from wind turbine to wind turbine, on a route off of roads. These routes are referred to as "crane walks." Crane walks would be approximately 40-foot wide temporary disturbances that would be reclaimed following construction, similar to other disturbed areas of the Proposed Project Components. The final distance and placement of crane walks would be determined as a result of the final turbine layout.

Lay Down Areas: The temporary staging area would be developed on approximately 40 acres, primarily consisting of cropland to minimize grading (although final locations would need to be determined). The staging area would house the construction office trailers and would provide worker vehicle and equipment parking areas, construction staging for limited project components, and a location for construction safety meetings. To prepare the temporary staging area, vegetation would be cleared, as needed, and graded. Gravel would be placed to provide a level ground surface and control dust. Excess spoil material and topsoil salvaged from the site would be stockpiled. After construction has been completed, the area would be restored.

Transmission: For the Crow Lake Alternative, a new 230-kV transmission line would be required to deliver the power from the collector substation to a 230-kV interconnection point at Western's Wessington Springs Substation. The Wessington Springs Substation is located approximately nine miles from the collector substation.

The Applicants have identified three alternate transmission line corridors. Due to engineering considerations, the alternative 1 transmission line corridor includes an area outside of the original Crow Lake Alternative boundary; this boundary will reflect the revised transmission line route in the Final Environmental Impact Statement (FEIS). Each of the three transmission line corridors are approximately 11 miles in length. The transmission line would be built using steel single-pole structures. The structures would be about 85 to 95 feet high and span about 800 feet; the right-of-way for the transmission line would be 125 feet wide. Each transmission line structure construction area would have temporary impacts encompassing 100-feet by 125-feet, and there would be a permanent impact of a 20-foot radius around each structure. The transmission line corridor would include a 12-feet wide centerline area to allow for the movement of equipment along the route of the transmission line and include six to eight structures per mile. In addition, pulling sites for each of the alternative transmission line corridor options would include two 125-foot by 300-foot areas for each of the turning locations.

2.3.2 PRE-CONSTRUCTION ACTIVITIES

Based on guidance from Western and RUS in coordination with the Applicants, additional resource surveys and engineering siting would occur that may adjust the currently proposed turbine locations. Pre-construction activities include site-specific surveys and studies, securing landowner agreements, project planning and design, and securing applicable permits. The final layout would depend on the results of these pre-construction activities. Factors which may affect the locations of individual turbines include, but are not limited to, Class III archaeological survey results, biological assessments, a wetland delineation (including jurisdictional Waters of the U.S. [WUS], collectively termed "wetlands") and other resource and engineering considerations. The following list describes the pre-construction activities that have currently been identified.

- A Biological Assessment (BA) will be prepared for consultation with the USFWS in accordance with Section 7 of the ESA. The BA will be prepared and submitted to the USFWS by the Agencies. The results of the BA will be incorporated into the FEIS and the Record of Decision (ROD)
- Avian and bat use surveys are currently being conducted to determine species presence, composition and suitable habitat
- Biological monitoring activities would also be conducted, and coordination with USFWS would occur before and during the geotechnical investigations

- It is anticipated that a wetland delineation would be conducted prior to the start of construction in accordance with USACE standard protocols to identify any wetland potentially affected by the Proposed Project
- To determine what type(s) of concrete foundations would be needed for each wind turbine generator, the Applicants anticipate conducting geotechnical investigations to identify subsurface soil conditions, rock types and strength properties
- Prior to the geotechnical field investigation, a Class III archaeological survey would be conducted in consultation with the South Dakota SHPO
- A Class I cultural resources inventory has been completed. The inventory includes a review of existing cultural resources documentation on file in State repositories, a preliminary architectural history windshield survey within the Proposed Project study area, and a review of 19th century Public Land Survey maps
- On-the-ground Class III field surveys will be conducted along the areas of future ground disturbance including all Proposed Project Components. The results of the Class III survey would be considered in the final engineering of the Proposed Project
- The Proposed Project would be located entirely on privately-owned lands pursuant to lease agreements negotiated between the landowners and the Applicants. These leases would allow construction and operation of wind facilities for a negotiated term
- Additional permits would be obtained and are described in **Chapter 1** in **Table 1.1**

2.3.3 CONSTRUCTION

The Applicants would like to begin construction in mid-2010 and complete construction by the end of 2010. It is anticipated that local workers from the counties would fill the majority of the open construction jobs. Anticipated labor trades required during construction include electricians, crane operators, heavy equipment operators, and other skilled construction laborers. Construction activities would entail the following phases, listed in approximate order of occurrence, although some of the activities would be carried out concurrently:

- Road clearing for access roads for construction and maintenance
- Construction of wind turbine foundations (grading, excavation, reinforcing steel placement, and concrete pouring)
- Grading, trenching, and placement of underground utilities and collector substation (including electric and communication lines)
- Overhead transmission line construction
- Tower assembly, nacelle installation, rotor assembly, rotor installation, and equipment installation including installation of the communication system, supervisory control and data acquisition (SCADA) software and hardware, and telephone or fiber-optic cables
- Final road grading, erosion control and reclamation

Construction activities would be temporary and would involve the use of heavy equipment including bulldozers, graders, trenching machines, concrete trucks, tractor-trailer trucks, and large cranes.

A contractor would be primarily responsible for construction management. The contractor would use the services of local contractors, where possible. Construction management would consist of:

- Securing building, electrical, grading, road, and utility permits
- Performing detailed civil and structural engineering
- Scheduling execution of construction activities
- Completing surveying and geotechnical investigations
- Forecasting project labor requirements and budgeting

The Proposed Project would be constructed under the direct supervision of the on-site construction manager with the assistance of local contractors. The construction consists of the following tasks:

- Site development, including roads
- Foundation excavation
- Installation of concrete foundations
- Electrical and communication system installation
- Tower assembly and machine assembly
- System testing

Throughout the construction phase, ongoing coordination would occur between the Proposed Project development and the construction teams. The on-site construction manager would help coordinate the project, including engaging in ongoing communication with local officials, citizens groups, and landowners.

2.3.4 OPERATION AND MAINTENANCE

Each wind turbine would communicate directly with the SCADA system for the purposes of operation performance monitoring, energy reporting and trouble-shooting. Under normal conditions each wind turbine operates autonomously, making its own control decisions. The Proposed Project would be operated and maintained by the Applicants or a third-party contractor.

The Applicants and the appropriate supplier would control, monitor, operate, and maintain the Proposed Project by means of a SCADA computer software program. In addition to regularly scheduled on-site visits, the wind project could be monitored via computer. The primary functions of the SCADA system are to:

- Monitor status
- Allow for autonomous turbine operation
- Alert operations personnel to conditions requiring resolution
- Provide a user/operator interface for controlling and monitoring wind turbines
- Monitor field communications
- Provide diagnostic capabilities of wind turbine performance for operators and maintenance personnel

- Collect wind turbine, material and labor resource information
- Provide information archive capabilities
- Provide inventory control capabilities; and
- Provide information reporting on a regular basis

There would be a full-time operation and maintenance crew of 10 to 12 people that work in teams of two. If possible, the crews may work in staggered shifts. The two person crews would make trips to the turbines with an average of two turbines per day. With that schedule, the six crews conducting two trips per day would enable 12 trips from the maintenance building to turbines in a typical day.

In general, the heavy equipment and materials needed for site access, site preparation, turbine blade delivery, and foundation construction are typical of heavy construction projects and do not pose unique transportation considerations, except for the delivery of some turbine components as noted below. The movement of equipment and materials to the site during construction would cause a relatively short-term increase in traffic levels on local roadways during the construction period.

Transportation logistics have become a major consideration for wind energy development projects; the trend is toward larger rotors and taller towers and the associated equipment needed to erect them. Depending on the design, some of the turbine components would be extremely long (*e.g.*, blades) or heavy (*e.g.*, the nacelle). The size and weight of these components would dictate the specifications for site access roads for required rights-of-way, turning radii, and fortified bridges. Each turbine would require multiple truck shipments of components, some of which could be oversized or overweight.

Erecting the towers and assembly of the wind turbine generators would require a main crane with a capacity likely to be between 300 and 750 tons, depending on the turbine design, and may require several overweight and/or oversized shipments. In addition, main crane assembly would require a smaller assist crane, and several assist cranes would likely be required for rotor/hub assembly. Cranes would remain on site for the duration of construction activities.

Overweight permits usually are issued with specific dates during which transport is prohibited. These dates are State-specific but tend to eliminate periods during the spring when frozen ground is thawing. Over-dimension permits are likely to have travel time limits in congested areas, limiting movement to non-rush hour periods.

During operations, larger sites may be attended during business hours by a small maintenance crew. Consequently, transportation activities would be limited to a small number of daily trips by pickup trucks, medium-duty vehicles, or personal vehicles. It is possible that large components may be required for equipment replacement in the event of a major mechanical breakdown. Such shipments would be expected to be infrequent.

2.3.5 DECOMMISSIONING AND RESTORATION

The Applicants have a contractual obligation to the landowners to remove the wind facilities, including foundations to a depth of four feet, when the wind easement expires. They also reserve the right to explore alternatives regarding project decommissioning. Retrofitting the turbines and power system with upgrades based on new technology may allow the wind project to produce efficiently for many more years. Based on estimated costs of decommissioning and the salvage value of decommissioned equipment, the salvage value of the wind project may exceed the cost of decommissioning.

With some exceptions, transportation activities during site decommissioning would be similar to those during site development and construction. Heavy equipment and cranes would be required for dismantling turbines and towers, breaking up tower foundations, and regrading the site to the original contours. With the possible exception of a main crane, oversized and/or overweight shipments are not expected during decommissioning activities because the major turbine components can be disassembled, segmented, or reduced in size prior to shipment.

2.3.6 APPLICANTS' AND AGENCIES' INCLUDED BEST MANAGEMENT PRACTICES AND APPLICANTS' PROPOSED MEASURES

The Applicants and Agencies have included Best Management Practices (BMPs) and Applicants' Proposed Measures (APMs), by resource area, and as applicable, for the Proposed Project and proposed Federal actions to minimize impacts associated with construction, operation and decommissioning. The Applicants and Agencies have committed to these included BMPs and APMs prior to the evaluation of environmental impacts. **Table 2.2** summarizes the Applicants' and Agencies' included BMPs, and **Table 2.3** summarizes the APMs. The Applicants would follow standard construction practices, BMPs and APMs during the construction, operation and decommissioning of the Proposed Project Components; these measures may be imposed by State, local or other jurisdictions as the result of approvals for stormwater management, grading permits, building permits, *etc.* or may be the result of efficient and/or responsible construction. Further, Western maintains standard practices for constructing and modifying transmission lines and substations. The BMPs would be followed for any system modifications performed at Western facilities for the proposed Federal action. In addition, Western provides additional requirements for BMPs as part of its contracting requirements. These provisions are outlined in Western's Construction Standard 13 and are applied on a project-specific basis.

Table 2.2 Applicants' and Agencies' Included BMPs

Geology and Soils	<u>Applicants identified:</u> • The Applicants would use BMPs during construction and operation to protect topsoil and water resources and to minimize soil erosion. Practices may include containing excavated material, applying water, use of silt fences, protecting exposed soil with fabrics (especially near wetlands), stabilizing restored material, and revegetating disturbed areas with native grasses and forbs. • Additional geotechnical testing and engineering siting would occur that may adjust the locations of turbines. Engineering design would provide for site specific controls, as needed.
Water Resources	<u>Applicants identified:</u> • Additional resource surveys and engineering siting would occur that may adjust the locations of turbines. Water resource factors which may affect the locations of individual turbines include, but are not limited to, a wetland delineation (including jurisdictional WUS [collectively termed "wetlands"]), and other resource and engineering considerations. Wetlands would be avoided to the extent practicable during the construction phase. • The Applicants would use BMPs during construction, operation, and decommissioning of the site to protect topsoil and water resources and to minimize soil erosion. Practices may include containing excavated material, applying water, use of silt fences and fabrics, protecting exposed soil, stabilizing restored material, and revegetating disturbed areas with native species. <u>Western identified:</u> • Watering facilities and other range improvements would be repaired or replaced if they are damaged or destroyed by construction activities to their condition prior to disturbance, as agreed to by the parties involved.
Air Quality	<u>Applicants identified:</u> • The Applicants would use BMPs during ground disturbing activities and may include applying water, containing excavated material, use of silt fences, protecting exposed soil, stabilizing restored material, and revegetating disturbed areas to minimize short-term air quality effects. • Complaints regarding fugitive dust emissions would be addressed in an efficient and effective manner.
Threatened and Endangered Species	<u>Applicants, RUS and Western identified:</u> • Special status species or other species of particular concern would continue to be considered during post-EIS phases of the Proposed Project's development following management policies set forth by the appropriate land managing agency. This may entail conducting surveys for plant and wildlife species of concern along access and spur roads, staging areas, and construction sites as agreed upon by the land managing agency. In cases where such species are identified, appropriate action would be taken to avoid adverse impacts on the species and its habitat and may include, but is not limited to altering the placement of roads or structures as practical and monitoring construction activities.
Vegetation Resources	<u>Western identified:</u> • The areal limits of construction activities normally would be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey or construction activity. • In construction areas where recontouring is not required, vegetation would be left in place wherever possible and original contour would be maintained to avoid excessive root damage and allow for resprouting.

Table 2.2 Applicants' and Agencies' Included BMPs

Cultural Resources	• Prior to construction, all construction personnel would be instructed on the protection of cultural, paleontological, and ecological resources. To assist in this effort, the construction contract would address (a) Federal, State and tribal laws regarding cultural resources, fossils, plants and wildlife, including collection and removal; and (b) the importance of these resources and the purpose and necessity of protecting them.
Land Use	Applicants identified: • The Applicants would work closely with landowners to site access roads to minimize land-use disruptions to the extent possible; for further detail reference the Applicants' Fish and Wildlife Resources APMs in Table 2.3. Western identified: • Fences and gates would be repaired or replaced to their original condition prior to disturbance caused by the proposed Federal action as required by the landowner or the land management agency if they are damaged or destroyed by construction activities. Temporary gates would be installed only with the permission of the landowner or the land managing agency. • In construction areas (e.g., staging yards, spur roads from existing access roads) where ground disturbance is substantial or where recontouring is required, surface restoration would occur as required by the landowner or land management agency. The method of restoration normally would consist of returning disturbed areas back to their natural contour, reseeding (if required), installing cross drains for erosion control, placing water bars in the road, and filling ditches.

Table 2.2 Applicants' and Agencies' Included BMPs

Health and Safety	<u>Applicants identified:</u> Electric and Magnetic Fields (EMF): • To reduce the potential for EMF exposure, the Applicants would encourage conservation, encourage distributed generation, continue to monitor EMF research, encourage utilities to work with customers on household EMF issues, and provide public education. Hazardous Material and/or Hazardous Waste: • All petroleum fluids would be contained within the wind turbines and electrical equipment. Any petroleum wastes generated would be handled and disposed of in accordance with local, State and Federal regulations. Any spills would be immediately reported to construction inspectors so that cleanup activities could be implemented. All spill materials would be labeled and stored at a designated facility for appropriate disposal. Safety and Security: • The turbines would be placed approximately 400 feet from road right-of-way and 1,000 feet from any occupied residences unless a county or township variance is obtained. These distances are considered to be safe based on developer experience and are consistent with the required local setbacks. They also serve to reduce noise. • Security measures would be taken during construction and operation, including temporary and permanent (safety) fencing at the substation(s), warning signs, and locks on equipment and wind power facilities. Also, turbines would sit on solid steel enclosed tubular towers in which all electrical equipment would be located, within the towers except for the pad-mounted transformer. Access to the tower would only be through a solid steel door that would be locked when not in use. <u>Western identified:</u> • Hazardous materials would not be drained onto the ground or drainage areas. Totally enclosed containment would be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials.

Source: Applicants' construction details and BMPs received by Tierra EC 2009; Agencies' construction details and BMPs received by Tierra EC 2009

Note: Only resource categories with identified BMPs are included in this table; the Applicants have agreed with and will implement the Agencies' identified BMPs

Table 2.3 APMs

Water Resources	Applicants identified: • If impacts to wetlands (including jurisdictional WUS [collectively termed "wetlands"]) are unavoidable, then the Applicants would obtain a section 404 Permit through the USACE. Temporary impacts to jurisdictional wetlands would be restored to their pre-construction condition in coordination with the USACE; permanent impacts would be mitigated according to USACE requirements. Temporary impacts to non-jurisdictional wetlands would also be restored to their pre-construction conditions. • Wetlands within USFWS easements on private property are under USFWS jurisdiction. If wetland impacts in USFWS easements could not be avoided, the Applicants would work with the USFWS to obtain permits for the impact and create/implement required mitigation.
Air Quality	Applicants and Agencies' identified: • Air quality effects caused by dust would be short-term, limited to the time of construction, and would not exceed National Ambient Air Quality Standards (NAAQS) particulate standards. • The construction, operation, and decommissioning of the site would adhere to all requirements of those entities having jurisdiction over air quality matters. Any permits needed for construction activities would be obtained. Open burning of construction trash would not be allowed unless permitted by appropriate authorities.
Threatened and Endangered Species	Applicants and Agencies' identified: • Whooping Crane Monitoring Plan/Sightings: The Proponent will develop a Whooping Crane Monitoring Plan as part of the Section 7 consultation process in coordination with the SDGFP. The plan will include, but will not be limited to, training project personnel in the identification of Whooping Cranes and Sandhill Cranes and USFWS reporting requirements; construction requirements; post-construction survey and reporting requirements; mortality monitoring; and adaptive management practices.

Table 2.3 APMs

Fish and Wildlife Resources	Applicants identified: • Prior to surface-disturbing activities during the avian breeding season, a qualified biologist would survey suitable habitat 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 and RUS. • If construction is to occur during the breeding season for raptors, prior to construction activities, raptor breeding surveys would be conducted by a qualified biologist through areas of suitable nesting habitat (grasslands and wooded areas) to identify active nest sites within one half-mile from the Proposed 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-site-specific and species-specific basis in coordination with Western and RUS. Reports of these activities will be submitted to USFWS and SDGFP. • Habitat impacts to migratory birds, due to both direct (project footprint) and indirect (avoidance effects) will be evaluated and quantified, and appropriate offsetting measures will be developed in coordination with the SDGFP and USFWS. • All temporary meteorological towers associated with the Proposed Project would be removed as soon as construction begins. Any permanent meteorological tower would be freestanding and have no guy wires. • Towers would be lit according to current USFWS guidance regarding reduction of avian mortality associated with turbine tower lights. • Avian and Bat Protection Plan (ABPP): An Avian and Bat Protection Plan will be developed in coordination with the USFWS and SDGFP. It will include, but not be limited to, construction requirements; post-construction avian and bat survey and reporting requirements; avian and bat mortality monitoring; and adaptive management practices
Vegetation Resources	Applicants identified: • The Applicant would develop a post-construction noxious weed monitoring program and would conduct surveys according to that program for three years post-construction, with follow-up surveys in problem areas. • Annual post-construction monitoring and treatment would occur as determined through coordination with the SDPUC and Western and RUS. • Grasslands within USFWS easements on private property are under USFWS jurisdiction. If grassland impacts in USFWS easements cannot be avoided, the Applicants would work with USFWS to obtain permits for the impact and create required mitigation. • Temporarily disturbed areas would be reclaimed by replacement of topsoil and seeding. Revegetation would occur as soon as possible to establish vegetative cover and avoid establishment of weeds. Agricultural lands would be returned to their original use. Regionally native seed or seed mix approved by the county and landowners would be used. If native prairie areas are disturbed they would also be reseeded with a native seed mix. • Noxious weeds would be controlled using appropriate weed control measures. • Dust emissions would be minimized during clearing, grading and other construction activities to avoid adversely affecting vegetation.

Table 2.3 APMs

Cultural Resources	Applicants and Agencies' identified: The following measures would be implemented to address impacts to the area of potential effects (APE): • The Applicants would continue to make a reasonable effort to design the project in such a manner as to minimize impacts to National Register of Historic Places (NRHP) listed and eligible properties. The following APMs would also be implemented to address impacts: • Tribes that are in the consultation process would be contacted if archaeological resources or other properties of tribal interest are identified during construction. • The appropriate tribal representatives and the State Historical Society would be contacted if a burial site is encountered during construction. NAGPRA allows tribes to protect American Indian graves and to repatriate human remains. • No surface disturbance would occur within the boundary of any NRHP eligible property prior to completion of the field phase of a data recovery plan that would be reviewed and approved by the South Dakota State Historical Society. • No surface disturbance would occur within the boundary of a site until its NRHP eligibility is determined. If a site is determined to be eligible, no surface disturbance would occur within the boundary of the site prior to completion of the field phase of a data recovery plan that would be reviewed and approved by the South Dakota State Historical Society. • Cultural resources would continue to be considered during post-EIS phases of project development following the development of an MOA in conjunction with preparation of the EIS. This would involve intensive surveys to inventory and evaluate new discoveries (cultural resources not previously identified). In consultation with appropriate land managing agencies, tribal and State Historic Preservation Officers, specific mitigation measures would be developed and implemented to mitigate any identified adverse impacts. These may include project modifications to avoid adverse impacts, monitoring of construction activities, and data recovery studies. American Indian Tribes would be involved in these consultations to determine whether there are effective or practical ways of addressing impacts on traditional cultural places.
Transportation	Applicants and Agencies' identified: Air Traffic: • The Applicants are coordinating with FAA on layout and lighting and would seek design approval from FAA. Wind turbines and meteorological • Structures and/or ground wire would be marked with highly visible devices where required by governmental agencies (e.g., FAA).
Noise	Applicants and Agencies' identified: • While there are no Federal noise standards that directly regulate noise from the operation of wind turbines, the EPA guidelines recommend a day-night average sound level (L_{dn}) of 55 dBA in typically quiet outdoor and residential areas. As a design characteristic, and in order to achieve the recommended L_{dn}, wind turbines would be set back at least 1,000 feet from occupied residences. • Noise associated with the short-term construction of the transmission corridor would be abated through engineering design by avoiding placement of a structure adjacent to a residence. • Western would continue to monitor studies performed to determine the effects of audible noise and electrostatic and electric and magnetic fields to ascertain whether these effects are significant.

Source: Applicants' Proposed Measures received by Tierra EC 2009; additional detail included from the Agencies' construction details and BMPs received by Tierra EC 2009
Note: Only resource categories with identified measures are included in this table

2.4 WINNER ALTERNATIVE

2.4.1 PROPOSED PROJECT COMPONENTS

The Winner Alternative is located on an approximately 83,000-acre area entirely within Tripp County, approximately eight miles south of the City of Winner, South Dakota. The facilities for the Winner Alternative would be similar to those described for the Crow Lake Alternative (**Section 2.3.1**). However, the difference is that the Winner Alternative would require a 34.5-kV to 115-kV collector substation as well as a 115-kV transmission line to interconnect to Western's existing 115-kV Winner Substation (compared to the 230-kV components described for the Crow Lake Alternative). The Winner Substation is located approximately nine miles from the proposed collector substation. Two alternative transmission line corridors are considered. Depending on the route, the transmission line would be approximately 10 to 11 miles long. The transmission line would be built using steel single-pole structures. The structures would be about 75 to 85 feet high and span about 800 feet. A map depicting the Winner Alternative is included in **Chapter 1** as **Figure 1-4**.

At this time, the Applicants have not prepared a drawing of an electrical bus arrangement for the Winner collector substation. An example layout is depicted in **Figure B-5, Appendix B**.

2.4.2 PRE-CONSTRUCTION ACTIVITIES

The pre-construction activities for the Winner Alternative would be the same as those described for the Crow Lake Alternative. Refer above to **Section 2.3.2** for the additional pre-construction detail.

2.4.3 CONSTRUCTION

The construction aspects for the Winner Alternative would be similar to those described for the Crow Lake Alternative. Refer above to **Section 2.3.3** for the additional details regarding construction.

2.4.4 OPERATION AND MAINTENANCE

The operation and maintenance aspects for the Winner Alternative would be the same as those described for the Crow Lake Alternative. Refer above to **Section 2.3.4** for the additional operation and maintenance detail.

2.4.5 DECOMMISSIONING AND RESTORATION

The decommissioning and restoration aspects for the Winner Alternative would be the same as those described for the Crow Lake Alternative. Refer above to **Section 2.3.6** for decommissioning and restoration detail.

2.4.6 APPLICANTS' AND AGENCIES' INCLUDED BMPS AND APMS

The Applicants' and Agencies' included BMPs and APMs, for the Winner Alternative would be the same as those described for the Crow Lake Alternative. Refer above to **Section 2.3.6** and **Table 2.2** and **Table 2.3** for the additional detail regarding those measures and practices.

2.5 NO ACTION ALTERNATIVE

Under the No Action Alternative, Western would deny the interconnection request (and RUS would not provide financial assistance). For the purpose of impact analysis and comparison in this EIS, it assumed that the Applicants' Proposed Project would not be built and the environmental impacts, both positive and negative, associated with construction and operation would not occur.

2.6 ESTIMATED SURFACE DISTURBANCE AREA

Table 2.4 below describes the anticipated estimated surface disturbance areas associated with the Proposed Project Components for each of the alternatives (note that the No Action Alternative would not result in any surface disturbances). These are conservative estimates based on 101 turbine locations and associated facilities, plus the ten additional turbine locations that may be utilized as contingent turbine locations for the Proposed Project if specific turbine locations are eliminated as a result of additional resource surveys and engineering siting; or they may be installed within the selected site at a later date, pending future load, transmission availability, and renewable production standard requirements. If the Proposed Project is approved and following identification of the preferred project site, the Applicants will determine the exact locations for the 101 turbines and project facility components. Western's action would be limited to previously disturbed areas within its existing substations, unless studies dictate the need to expand the Winner Substation.

2.7 SUMMARY OF IMPACTS BY ALTERNATIVE

Table 2.4 summarizes the quantity of surface disturbance areas for each of the alternatives discussed in the DEIS. **Table S.3** provides a summary of the impacts by resource type, as discussed in **Chapter 4**.

Table 2.4 Estimated Surface Disturbance Areas – Crow Lake and Winner Alternatives

Disturbance Type		Crow Lake Alternative Temporary (acres)	Crow Lake Alternative Permanent (acres)	Winner Alternative Temporary (acres)	Winner Alternative Permanent (acres)
Wind Turbine Generator Assembly Area/Pads		637	4.9	637	5.0
Crane Walks		282	N/A	530	N/A
Electrical Collections Lines (Underground)		105	N/A	198	N/A
Electrical Transmission Lines (Overhead)	Alternative 1	56*	0.13	42	0.12
	Alternative 2	53	0.13	56	0.18
	Alternative 3	55	0.13	NA	NA
Access Roads		255	126	1,710	254
Collection Substation		10	1.8	10	1.8
O &M Building		20	0.15	20	0.15
Temporary Lay Down Area		40		40	
Total Project Impacts (Max Preferred)		1,405	133	3,187	261
Total Alternative Area (acres within boundary)		37,000		83,000	

Note: Quantified impacts include the 101 turbine locations required for the Proposed Project plus the ten additional turbine locations that may be utilized as contingent turbine locations for the Proposed Project if specific turbine locations are eliminated as a result of additional resource surveys and engineering siting; or they may be installed within the selected site at a later date, pending future load, transmission availability, and renewable production standard requirements. This approach is conservative because it identifies a greater amount of disturbance than what would be required for the Proposed Project.

* Due to engineering considerations, the overhead transmission line location includes area outside of the Crow Lake Alternative boundary; this boundary will be revised to include the transmission line route in the FEIS.

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3 AFFECTED ENVIRONMENT

This chapter describes the baseline condition of the area that could be affected by the Proposed Project. The affected environment, or region of influence (ROI), is the physical area that bounds the environmental, sociological, economic, or cultural feature of interest that could be impacted by construction and operation of the Proposed Project and the proposed Federal actions. The boundaries of the ROI may vary depending on the resource being analyzed. The baseline condition serves as a reference point for the evaluation of impacts presented in **Chapter 4**, Environmental Consequences. For ease of understanding the evaluation of impacts and correlating **Chapters 3 and 4**, the document has been prepared so that a resource described in **Chapter 3**, Affected Environment, has the same section number in **Chapter 4**, Environmental Consequences (*e.g.*, **Section 3.2** Water Resources, **Section 4.2** Water Resources).

The Proposed Project affected environment descriptions are presented for the Crow Lake and Winner alternatives. Instances are noted where the affected environment descriptions for the proposed Federal actions differ from those of the Proposed Project alternatives.

Critical Elements of the Human Environment, as defined and specified in the above-listed statutes and Executive Orders, that could be impacted by the Proposed Project include:

- Geology and soils
- Water resources
- Climate change and air quality
- Biological resources
- Cultural resources
- Land use
- Transportation
- Visual resources
- Noise
- Socioeconomics
- Environmental justice
- Health and safety

Critical elements of the human environment that would not be affected are listed below, followed by the justification for dismissal of these elements from further discussion.

Paleontology – Investigations of publicly available maps and local geology did not identify paleontological resource sites in the Proposed Project area. The glacial till and outwash deposits that comprise the majority of the surface soils in the area are unlikely to contain fossils.

Wild and Scenic Rivers – Review of the U.S. Department of Interior, National Park Service (NPS) website indicates that there are no Federally-designated Wild and Scenic Rivers in South Dakota (NPS 2004).

Wilderness – There are no Federally-designated wilderness areas near the Proposed Project alternatives.

3.1 GEOLOGY AND SOILS

The ROI for geology and soils includes areas of immediate disturbance associated with implementation of the Proposed Project Components and proposed Federal actions. Because existing data on geologic resources is not available for the specific sites, the geology in the vicinity of the alternatives is summarized.

3.1.1 GEOLOGY

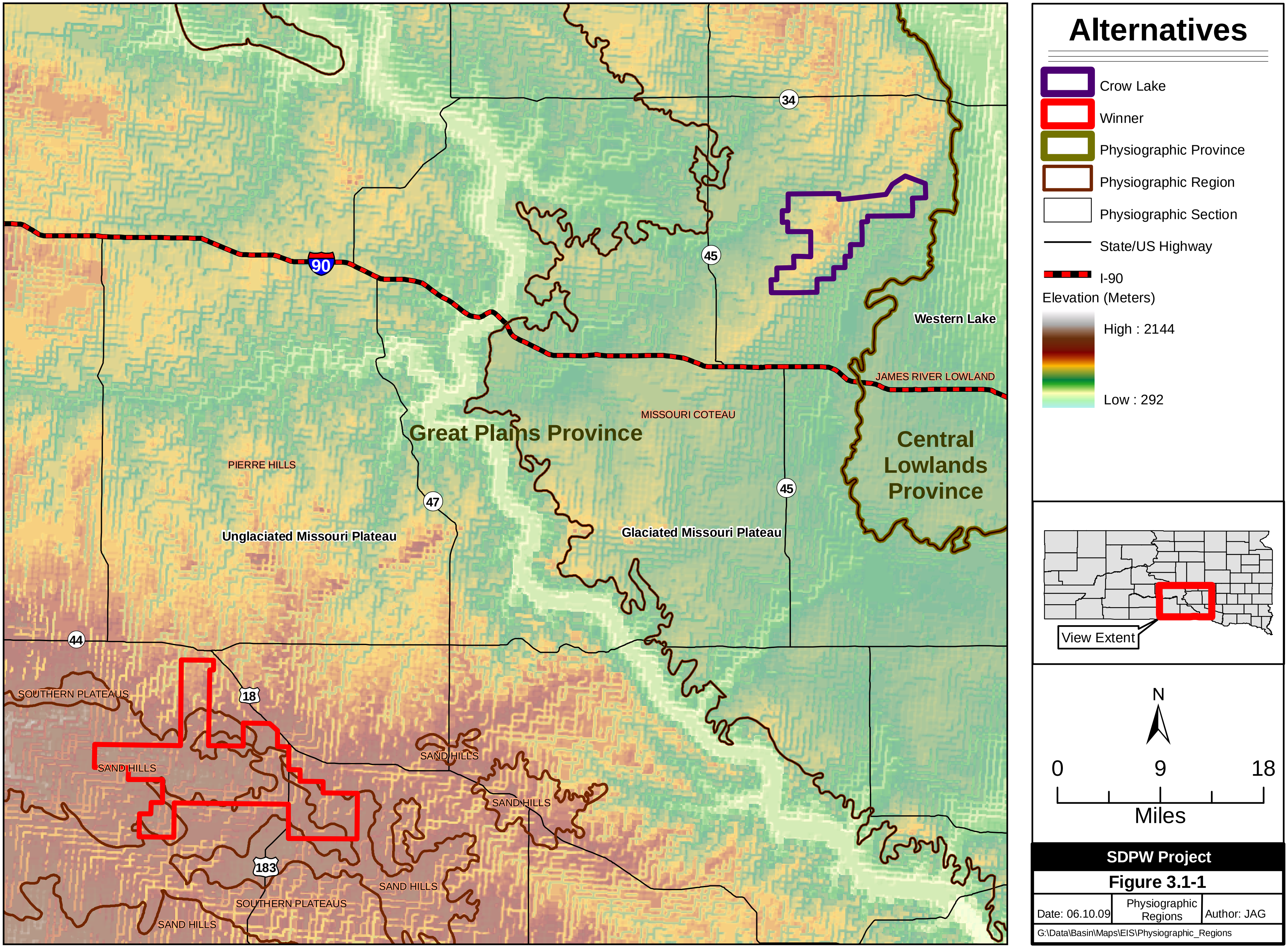
3.1.1.1 Crow Lake Alternative

Information and data for the compilation of this section is from *Bulletin 32 – Geology of Aurora and Jerauld Counties, South Dakota* (Hedges 2001)*, Aquifer Materials Map 21 – First Occurrence of Aquifer Materials in Aurora County, South Dakota* (Jensen 2004), *Aquifer Materials Map 21 – First Occurrence of Aquifer Materials in Jerauld County, South Dakota* (Jensen 2005), and *Compilation of Resource Technical Memorandums – Crow Lake Project, Portions of Jerauld, Aurora, and Brule Counties, South Dakota* (Terracon 2009a).

The topography of the Crow Lake Alternative is characterized by gently rolling hills with low to moderate relief. Elevation for the site ranges from approximately 1,500 to 1,900 feet above mean sea level (AMSL). The Crow Lake Alternative is located within the Glaciated Missouri Plateau (also known as the Coteau du Missouri Section) of the Great Plains physiographic province, which is characterized by low hummocky, undulating hills and large undrained areas containing prairie potholes, lakes and sloughs (see **Figure 3.1-1**). Strata for this highland area are characterized by glacial deposits which are underlain by the Upper Cretaceous Pierre Shale and older formations. A northeast-southwest trending axis in the site topography marks a steep escarpment corresponding with a ridge in the bedrock underlying the site. The escarpment rises 300 to 400 feet above the James River Basin east of the site.

In general, geomorphology of the region consists of physiographic features formed by glacial advancement and retreat during the Pleistocene epoch. Surficial deposits on the site consist of glacial till, moraine deposits and outwash from the Late Wisconsin period of the Quaternary age.

The strata of the region include formations from the Precambrian age, dated to 2.5 billion years ago, to the Holocene epoch. Formations include Precambrian granite and quartzite rocks; Mesozoic shales and sandstones of late Cretaceous age; and Cenozoic nonmarine silts and sandstones of Tertiary age. The Quaternary strata include the Pleistocene nonglacial and glacial sediments, and Holocene sediments (Hedges 2001).


Alternatives
Crow Lake
Winner
Physiographic Province
Physiographic Region
Physiographic Section
State/US Highway
I-90
Elevation (Meters)
High : 2144
Low : 292
View Extent
N
0
9
18
Miles
SDPW Project
Figure 3.1-1
Date: 06.10.09
Physiographic Regions
Author: JAG
G:\Data\Basin\Maps\EIS\Physiographic_Regions
Great Plains Province
Central Lowlands Province
Western Lake
JAMES RIVER LOWLAND
MISSOURI COTEAU
Glaciated Missouri Plateau
Unglaciated Missouri Plateau
PIERRE HILLS
SOUTHERN PLATEAUS
SAND HILLS
90
34
45
47
44
18
183

The Pierre Shale of the late Cretaceous age underlies the site and creates the base of the northeast-southeast axis in elevation of the Crow Lake Alternative. The Pierre Shale also occurs as isolated surface outcrops at elevations as high as 1,900 feet AMSL within the site.

Quaternary sediments in the region consist of Pleistocene western-derived nonglacial alluvium, glacial deposits, loess and Holocene alluvium and colluvium. Pleistocene tills comprise the bulk of the Quaternary deposits in the region, although Pleistocene outwash or lake deposits may be substantial. The Quaternary deposits may also include Plio-Pleistocene western-derived fluvial sand and gravel deposits and Holocene alluvium and colluvium. Collectively, these sediments can exceed 500 feet in thickness in the region and comprise the large majority of the surficial sediments (Hedges 2001).

Within the Crow Lake Alternative boundary, the composite thickness of the Upper Wisconsin till may be up to 300 feet. Quaternary sediments occurring at the surface of the site include:

- Undifferentiated glacial outwash – consists of heterogeneous sand and gravel with minor clay and silt. Of glaciofluvial origin, this formation includes outwash plains, kames, kame terraces and other undifferentiated deposits, and is expected to be up to 30 feet thick.
- Stagnation moraine till – includes a compact, silty, clay-rich matrix with sand- to boulder-sized clasts. This glacial, geomorphic feature is characterized by hummocky terrain with abundant sloughs resulting from the stagnation of ice sheets.
- Ground moraine till – also consists of a compact, silty, clay-rich matrix with sand- to boulder-sized clasts. The geomorphic feature is characterized by smooth, rolling terrain formed by glaciers.
- Terrace outwash – occurs at the extreme northwest corner of site represented by heterogeneous clay to gravel of glaciofluvial origin. This formation is expected to be up to 60 feet thick.
- Alluvial deposits are found within the present-day drainage of East Smith Creek.

3.1.1.2 Winner Alternative

Information and data for the compilation of this section is from *Ground Water Supply for City of the Winner, South Dakota* (Barari 1966), *Groundwater Investigation for the City of Colome, South Dakota* (Barari 1969), *Hydrogeologic Assessment of the High Plains Aquifer in Tripp and Gregory Counties, South Dakota* (Filipovic 2004), and *Compilation of Resource Technical Memorandums - Winner Project Site, Tripp County, South Dakota* (Terracon 2009b).

The Winner Alternative lies within the Great Plains physiographic province. The majority of the site is in the Unglaciated Missouri Plateau Section, which is also described as Tertiary Table Lands or Sand Hills (see **Figure 3.1-1**). The northeastern-most fringe of the site near the City of Colome is also in the Unglaciated Missouri Plateau Section, but is also described as a part of the Pierre Hills. Areas of the south-central portion of the site are in the Southern Plateaus, which are associated with the High Plains Section of the Great Plains physiographic province.

The vicinity of the Winner Alternative is characterized by rolling plains of relatively low relief, developed on the marine rocks of the Pierre Shale. To the south, elevations rise into butte and mesa topography, typical of the Tertiary tablelands. The stratigraphy of the region includes formations from Precambrian, dated to 2.5 billion years ago, to Quaternary age. Similar to the Crow Lake Alternative, formations include Precambrian granite; Cambrian and Ordovician sands; Paleozoic sediments; Cretaceous age shales and sandstones; Cenozoic nonmarine silts; sandstones of Tertiary age; and Quaternary alluvium and eolian sediments.

3.1.2 SOILS

Geographic Information System (GIS) data depicting soil types within and adjacent to the Proposed Project alternatives were obtained from the Natural Resources Conservation Service (NRCS 2009). Soils within the Proposed Project alternatives were overlain on a GIS map of the Proposed Project Components to identify soils within the affected environment.

3.1.2.1 Crow Lake Alternative

A total of nine soil unit associations are mapped in the Crow Lake Alternative area, as listed in **Table 3.1-1** and depicted in **Figure 3.1-2**. Soils within the Crow Lake Alternative are generally consistent, dominated by silty drift over loamy till. This includes soils of the Mobridge-Java-Highmore, Houdek-Ethan, Ethan-Clarno-Betts and Highmore-Ethan-Eakin soil unit associations, accounting for roughly 93 percent of the area. Along the northeastern most corner of the site, soils of the Dudley-Bon-Beadle soil unit association become more clayey. Other soil units within the area account for less than 1 percent of the area.

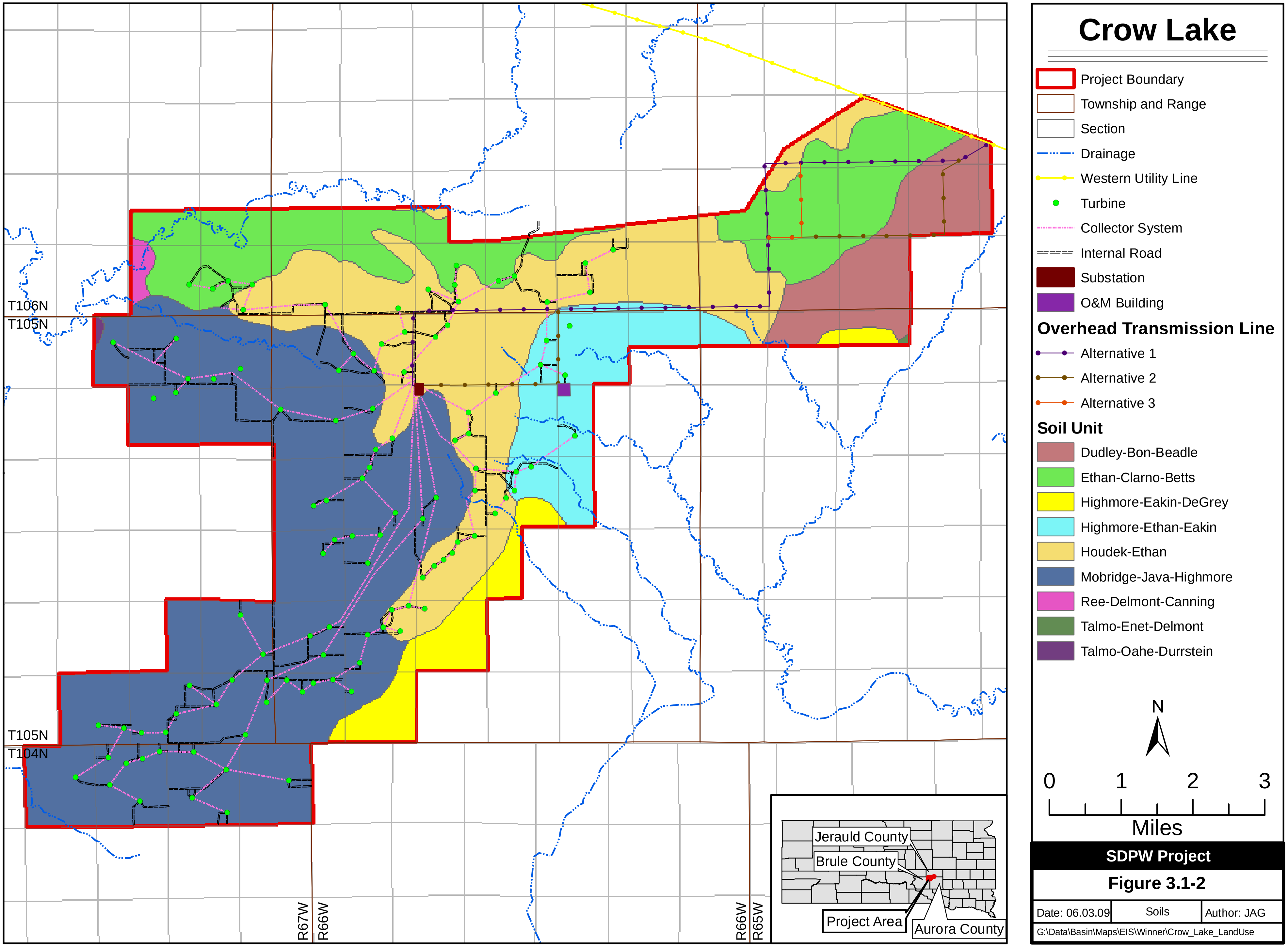
The soil erodibility factors (K), representing both susceptibility of soil to erosion and the rate of runoff, for site soils generally range from 0.28 to 0.32. This slight to moderate potential for erosion is typical for silt loam soils. Silty soils can be susceptible to detachment and produce moderate runoff, but the erosion potential is tempered by the loamy, organic content which lowers the susceptibility to detachment and increases infiltration (reducing runoff).

The predominant construction considerations for the site soils are the potential for shrink/swell and slopes in localized areas.

Table 3.1-1 Soils of the Crow Lake Alternative

Name	Predominant Soils	Flooding Frequency	Representative Slope	K Factor	Percentage of Area
Mobridge-Java-Highmore	Silty drift over loamy till and loamy till	None	4%	0.32	42.9%
Houdek-Ethan	Loamy till and silty drift over loamy till	None	4%	0.28	22.8%
Ethan-Clarno-Betts	Loamy till	None	5%	0.28	15.2%
Highmore-Ethan-Eakin	Silty drift over loamy till and loamy till	None	4%	0.32	7.61%
Dudley-Bon-Beadle	Clayey till and loamy till	None	2%	0.28	6.40%
Highmore-Eakin-DeGrey	Silty drift over loamy till and loamy till	None	1%	0.32	4.48%
Ree-Delmont-Canning	Loamy alluvium and loamy alluvium over outwash	None	2%	0.28	0.44%
Talmo-Oahe-Durrstein	Loamy till and outwash	None	1%	0.28	0.083%
Talmo-Enet-Delmont	Clayey till and silty drift	None	6%	0.28	0.030%

Source: NRCS 2009



Due to engineering considerations, the transmission line Alternative 1 location includes area outside of the Crow Lake Alternative boundary; this boundary will be revised to include the transmission line route in the FEIS.

3.1.2.2 Winner Alternative

A total of five soil unit associations are mapped within the Winner Alternative area, as listed in **Table 3.1-2** and depicted in **Figure 3.1-3**. The eastern half of the site consists of loamy and eolian sands of the Valentine-Tasssel-Anselmo soil unit. Moving eastward, loamy and eolian sands dominate, but become more intermixed with sandy alluvium. The northern portion of the site is dominated by the Millboro soil unit, which is more clayey in nature, derived from shale. Along the northern and eastern fringe of the ROI, occurrences of loess associated with the Reliance-Ree-Onita soil unit begin to appear.

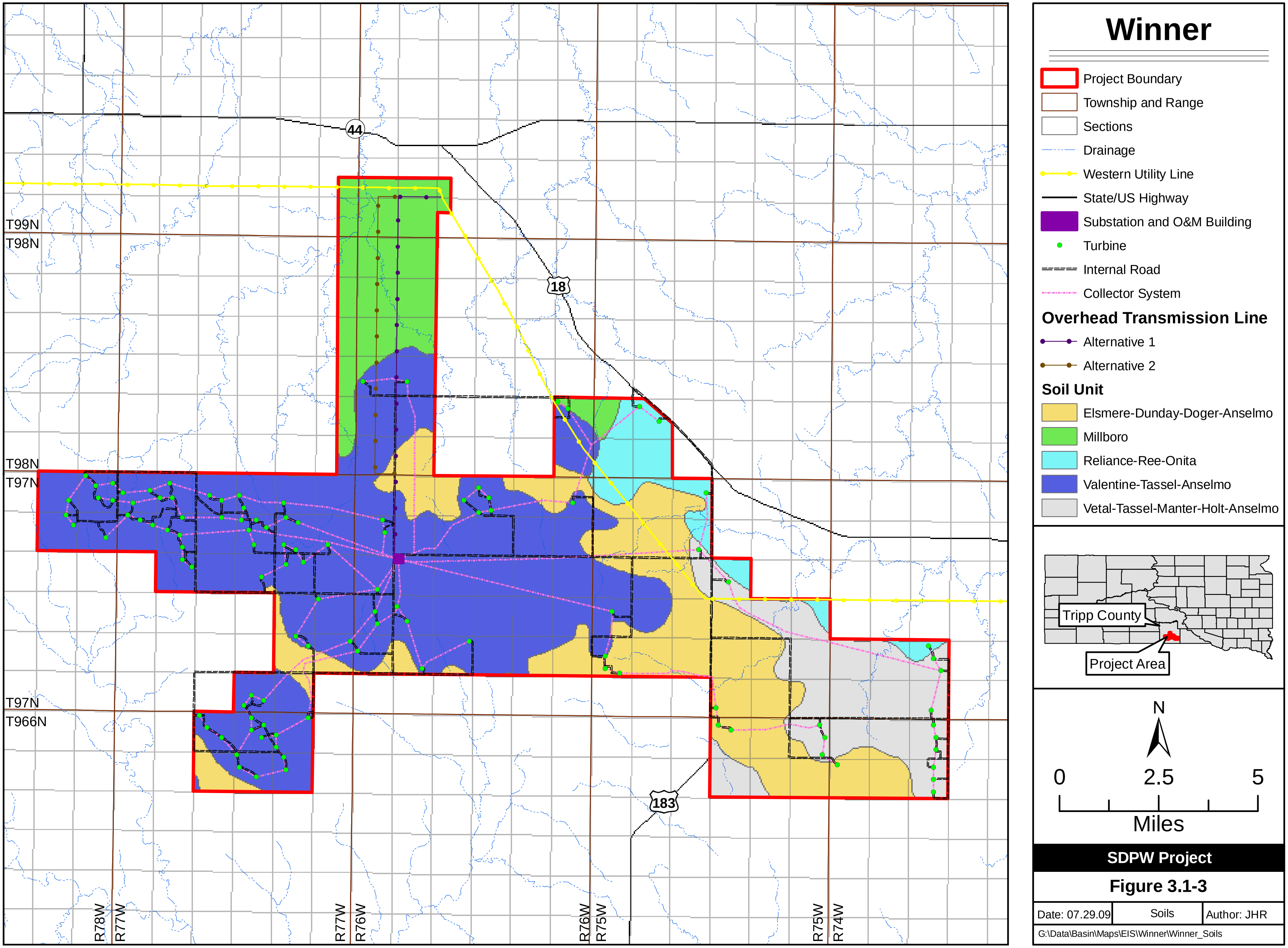
The K factors for the site soils range from 0.20 to 0.37, with the higher potential for erosion associated with the more clayey soils of the Millboro (in the north) and Reliance-Ree-Onita (to the northeast) soil units. Sandy soils and alluvium have lower erodibility factors due to low runoff potential and high permeability.

The predominant construction considerations for the site soils are localized slopes and the potential for shrink/swell with the clayey soils of the Millboro and Reliance-Ree-Onita soil units. Characteristics of the site soils relating to the potential for erosion and limitations for construction were obtained from the NRCS database (NRCS 2009)**.**

Table 3.1-2 Soils of the Winner Alternative

Name	Predominant Soils	Flooding Frequency	Representative Slope	K Factor	Percentage of Area
Valentine-Tassel-Anselmo	Eolian sands and loamy eolian sands	None	5%	0.20	50%
Elsmere-Dunday-Doger-Anselmo	Loamy eolian sands and sandy alluvium	None	2%	0.20	23%
Vetal-Tassel-Manter-Holt-Anselmo	Loamy eolian sands and loamy and sandy alluvium	None	1%	0.20	12%
Millboro	Clayey alluvium derived from shale	None	4%	0.37	10%
Reliance-Ree-Onita	Loess and loamy, clayey and sandy alluvium	None	1%	0.28	5%

Source: NRCS 2009


Winner
Project Boundary
Township and Range
Sections
Drainage
Western Utility Line
State/US Highway
Substation and O&M Building
Turbine
Internal Road
Collector System
Overhead Transmission Line
Alternative 1
Alternative 2
Soil Unit
Elsmere-Dunday-Doger-Anselmo
Millboro
Reliance-Ree-Onita
Valentine-Tassel-Anselmo
Vetal-Tassel-Manter-Holt-Anselmo
Tripp County
Project Area
N
0
2.5
5
Miles
SDPW Project
Figure 3.1-3
Date: 07.29.09
Soils
Author: JHR
G:\Data\Basin\Maps\EIS\Winner\Winner_Soils
T99N
T98N
T98N
T97N
T97N
T966N
R78W
R77W
R77W
R76W
R76W
R75W
R75W
R74W
44
18
183

3.2 WATER RESOURCES

The ROI for water resources encompasses hydrologic systems that could be impacted by discharges, spills and/or stormwater runoff associated with implementing the Proposed Project and proposed Federal actions.

3.2.1 SURFACE WATER RESOURCES

The Crow Lake and Winner alternatives are within the Missouri River Basin surface water drainage system. This system includes a watershed of approximately 529,350 square miles, including about 9,700 square miles in Canada (USACE 2006). The Missouri River Basin surface water drainage system consists of region, subregion, basin and subbasin drainages in accordance with hydrologic unit maps published by the U.S. Geological Survey (USGS). Six mainstem reservoir system dams line the Missouri River (beginning upstream): Fort Peck, Garrison, Oahe, Big Bend, Fort Randall and Gavins Point.

In the vicinity of the two sites, Fort Randall Dam on the Missouri River forms Lake Francis Case, and accepts drainage from the White River. Below the Fort Randall Dam is Gavins Point Dam, which impounds Lewis & Clark Lake. Ponca Creek and the Niobrara River join the Missouri River downstream of Fort Randall Dam, above Lewis & Clark Lake. The James River flows into the Missouri River downstream of Gavins Point Dam.

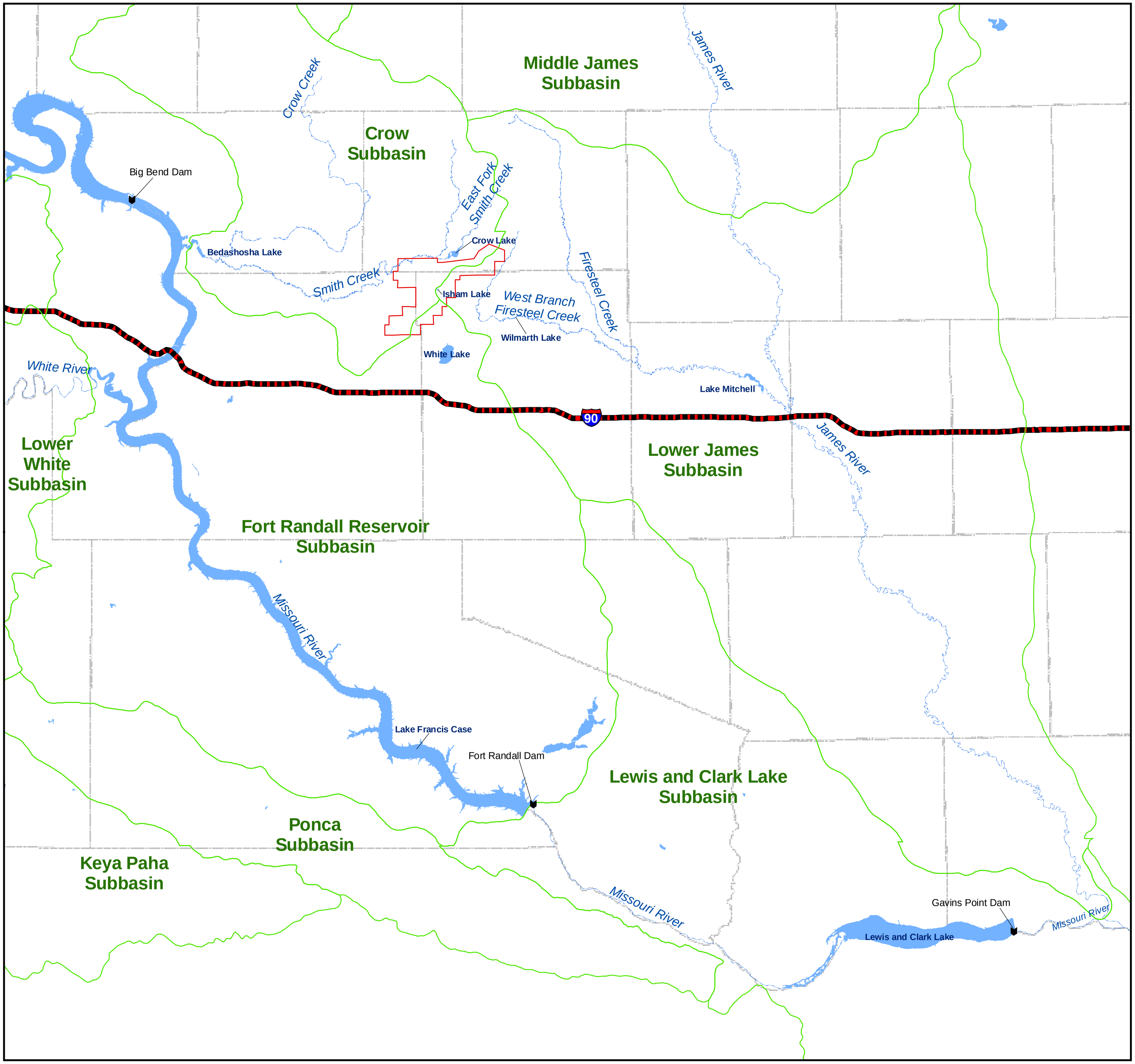
The following sections describe the path of surface water flows from within the alternative site boundaries to their confluence with the Missouri River. Impaired waters, listed under Section 303(d) of the CWA, within the flow path to the Missouri River are also discussed. Impaired waters do not meet water quality standards due to pollution or other degradation.

3.2.1.1 Crow Lake Alternative

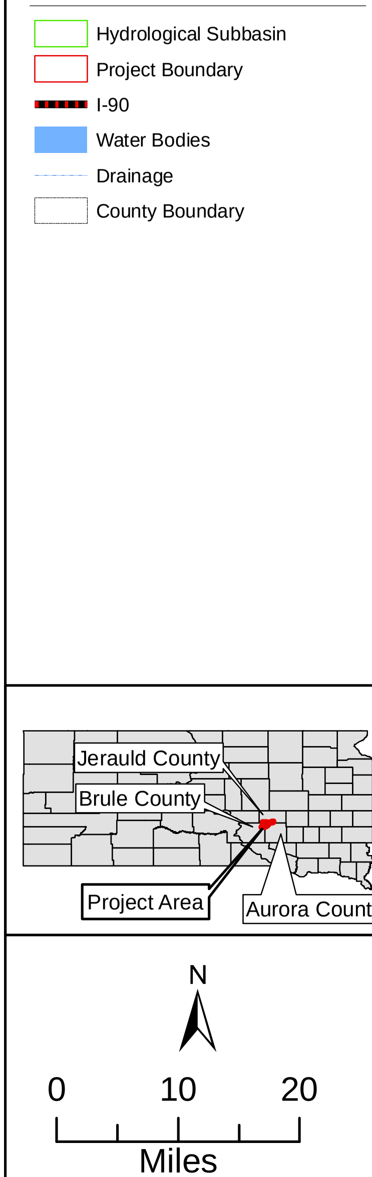
The Crow Lake Alternative is within the prairie pothole region of the northern Great Plains. As described in **Section 3.1**, well-drained, hilly terrain dominates the site along the northern and western side of a noticeable northeast-southwest trending axis in the site topography. The poorly drained prairie pothole areas and water-holding sloughs are along the eastern side of this axis. Intermittent streams are prevalent at the Crow Lake Alternative, and the stream drainages are dendritic, resembling the branching pattern of blood vessels or tree branches. Various intermittent and perennial lakes and ponds associated with prairie potholes and intermittent streams are throughout the site.

As depicted in **Figure 3.2-1**, drainage from the majority of the Crow Lake Alternative flows into the Missouri-White Subregion of the Missouri Region. A portion of the site along the north half of the eastern site boundary drains easterly toward the James Subregion of the Missouri Region.

Within the Missouri-White Subregion, the site falls into the Fort Randall Reservoir Basin and spans two subbasins:



Crow Lake



SDPW Project

Figure 3.2-1

Date: 06.03.09	Hydrology	Author: JAG

G:\Data\Basin\Maps\EIS\Crow_Lake\CrowLake_Hydrology

- The Crow Subbasin dominates the surface water drainage on the western and northwestern portions of the site
- The Fort Randall Reservoir Subbasin drains the southeastern portion of the site

Within the James Subregion:

- The Lower James Subbasin drains an eastern portion of the site

The Crow Subbasin

The majority of the Crow Lake Alternative lies within the Crow Subbasin. The East Fork of Smith Creek flows westerly into Crow Creek along the northern boundary of the site. Downstream of Crow Lake, East Fork Smith Creek converges into Smith Creek. Sayles Creek also begins within the northwestern portion of the site and flows into Smith Creek just west of the project boundary. Smith Creek continues westerly until the confluence with Crow Creek. Headwaters to these creeks originate within the site boundaries. Crow Creek used to flow into the man-made reservoir which formed Bedashosha Lake. Water was drained from the Bedashosha Lake impoundment, and the spillway and abutment walls were removed between 1995 and 2000. Crow Creek was restored to its natural elevation and currently flows through the lake bed and discharges to the Lake Francis Case portion of the Missouri River, just downstream of the Big Bend Dam (DENR 2009). No impaired waters lie downstream of the Crow Lake Alternative within this subbasin.

The Fort Randall Reservoir Subbasin

A small portion of the southeastern corner of the Crow Lake Alternative drains to the southeast in the Fort Randall Reservoir Subbasin. One unnamed stream drains Isham Lake, located within the site, and directs flows toward White Lake. White Lake is in this hydrologic subbasin, but does not have an outflow. No impaired waters lie downstream of the Crow Lake Alternative within this subbasin.

The Lower James Subbasin

The northeastern corner of the Crow Lake Alternative includes unnamed tributaries to the West Branch of Firesteel Creek. A dam was constructed along the West Branch to form Wilmarth Lake in 1936. Outflows exit over the spillway, and flow continues easterly to the convergence with Firesteel Creek. Firesteel Creek continues to flows eastward through Lake Mitchell and then into the James River at Mitchell, South Dakota. The James River flows south-southeast into the Missouri River downstream of the Gavins Point Dam at Yankton, South Dakota, outside of the ROI.

Substantial organic loading from nonpoint sources occur throughout the James River watershed during storm events (DENR 2008). Decay of organic matter contributes to low dissolved oxygen and degraded trophic state index. Agricultural activities such as livestock operations, grazing in riparian zones, lack of riparian vegetation, and row crop production contribute to the amount of suspended sediments and fecal coliforms in the basin. Wilmarth Lake, Firesteel Creek and segments of the James River are listed as impaired waters under Section 303(d) of the CWA.

3.2.1.2 Winner Alternative

The area is characterized by rolling plains of relatively low relief, giving rise to butte and mesa topography typical of the high plains. The Winner Alternative is located on generally well-drained terrain; intermittent streams are prevalent at the site. The upland portions of the Winner Alternative act as a drainage divide between the Missouri-White and Niobrara Subregions of the Missouri Region hydrologic unit. The northern portion of the site flows north as a part of the White Basin; the southern portion of the site flows south as a part of the Niobrara Basin, as depicted in **Figure 3.2-2**.

Within the White Basin:

- The Lower White Subbasin includes the northern portion of the site

The Niobrara Basin includes flows from the following subbasins:

- The Keya Paha Subbasin dominates the surface water drainage on the southwestern portions of the site
- The Ponca Subbasin drains the southeastern portion of the site

The stream drainages at the Winner Alternative are dendritic. Various intermittent and perennial lakes and ponds associated with artificially dammed intermittent streams are located across the Winner Alternative. The artificial lakes and ponds are primarily used for stock watering.

<u>Lower White Subbasin</u>

The headwaters and tributaries of Mud Creek and Dog Ear Creek begin on the northern portion of the site, flowing northward to their confluence just southwest of Winner, South Dakota. Dog Ear Creek continues northward until its confluence with the White River. Similarly, the headwaters of Sand Creek and Thunder Creek begin on the site. Following their confluence, Thunder Creek continues northward until its confluence with the White River. The White River flows eastward until discharging to the Lake Francis Case portion of the Missouri River, just downstream of Big Bend Dam, outside of the ROI.

A downstream segment of the White River is designated as impaired for elevated concentrations of total suspended solids (TSS) and fecal coliforms. Water quality throughout the White River basin is generally poor and often exceeds numeric standards (DENR 2008). Highly erosive soils from the western Badlands and within the river drainage are considered a major natural source of both suspended and dissolved solids. Rangeland grazing may also contribute to the TSS concentrations. DENR is currently reviewing a study to develop site-specific water quality criteria for the White River to address naturally occurring TSS. The source of fecal coliforms in the Lower White River may include animal feeding operations, crop production and livestock grazing.

<u>Keya Paha Subbasin</u>

The headwaters of an unnamed tributary to the Keya Paha River flow southward from the southern portion of the site, through Rahn Lake and continue southward to its confluence with the Keya Paha River. The Keya Paha River flows generally southeasterly across the South Dakota State line into Nebraska where it drains into the Niobrara River. The Niobrara River flows generally east-southeastward and drains into the Missouri River at Niobrara, Nebraska, downstream of the Fort Randall Dam and above Lewis & Clark Lake, outside of the ROI.

Rahn Lake is impaired for trophic state index due to nutrient enrichment and siltation related to agricultural activities. The Keya Paha River is impacted by fecal coliforms and TSS; sources of fecal coliforms likely include grazing in rangeland, riparian areas and/or along shorelines. TSS is thought to originate from natural sources. The Niobrara River is listed as impaired by the State of Nebraska for *Escherichia coli* (*E. coli*) contamination. Point sources have been identified and include municipal wastewater treatment facilities, fish hatchery/rearing facilities and confined animal feeding operations. Nonpoint sources may also contribute *E. coli*, including failing septic tanks, runoff from livestock pastures, improper or over-application of biosolids (wastewater treatment facility sludge, septage or manure) and urban storm water runoff not regulated by a NPDES permit. Wildlife may also contribute *E. coli* to the river (EPA 2005).

<u>Ponca Subbasin</u>

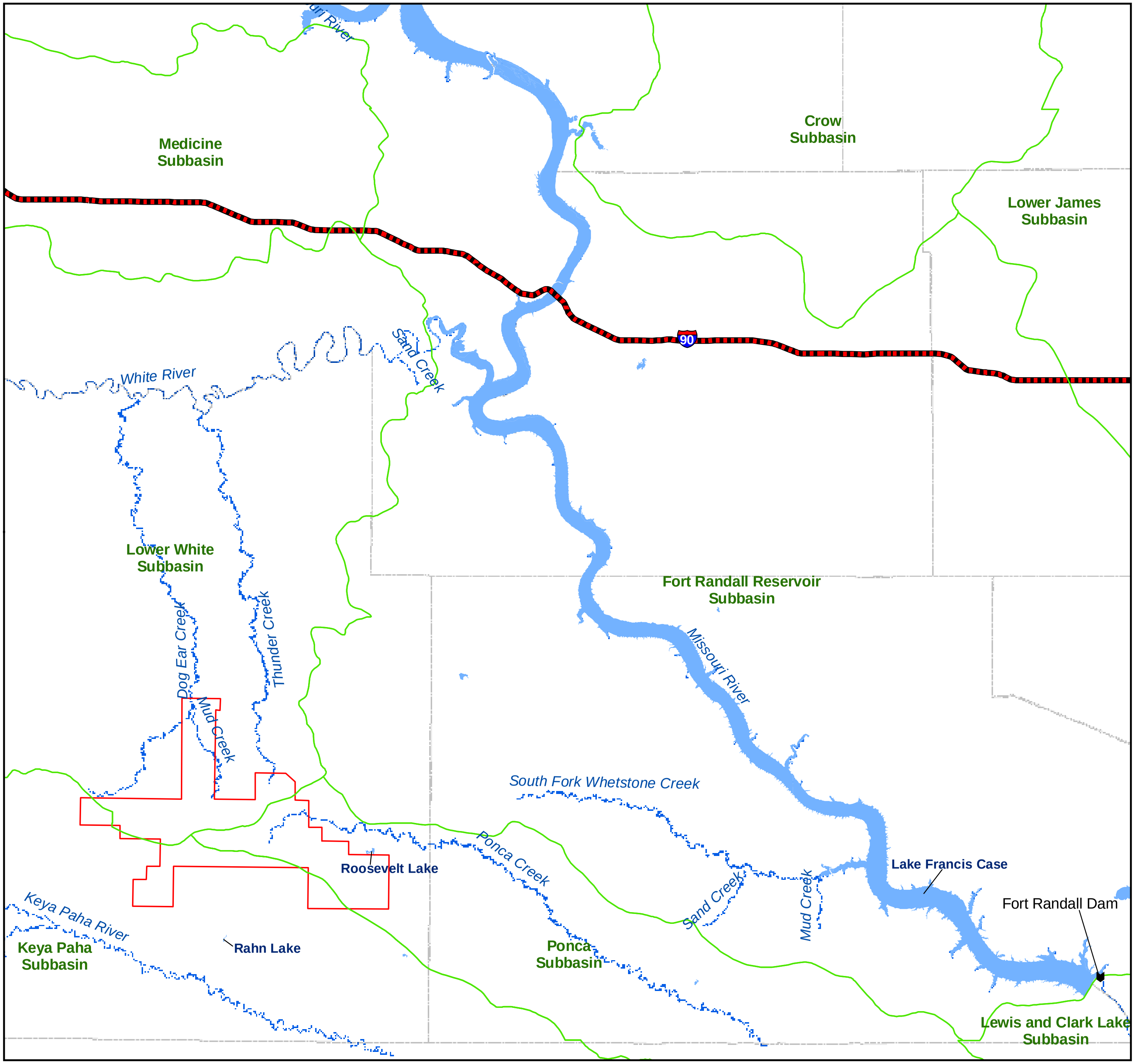
The eastern portion of the Winner site contains the unnamed headwaters to Ponca Creek, generally draining to the east and northeast. One tributary is dammed to form Roosevelt Lake near the eastern extreme of the site. The spillway from Roosevelt Lake directs flow northward to Ponca Creek. Ponca Creek flows east and southeast across the South Dakota State line into Nebraska, generally paralleling the Keya Paha River. Ponca Creek continues southeastward and drains into the Missouri River just upstream of the confluence of the Niobrara and Missouri rivers, outside of the ROI.

Roosevelt Lake has exhibited high concentrations of mercury, and is listed as impaired. The source of the mercury contamination is unknown. Assessment of the lake is included in the Lewis and Clark Watershed Assessment, which is ongoing by Randall Resource Conservation and Development and DENR. Ponca Creek has reported elevated concentrations of TSS and fecal coliforms, and is also impaired. Agricultural activities such as livestock operations, grazing in riparian zones, lack of riparian vegetation and row crop production likely contribute to the amount of suspended sediments and fecal coliforms in Ponca Creek.

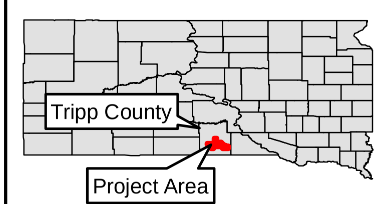
3.2.2 FLOODPLAINS

This DEIS evaluates mapped floodplains within the alternative site boundaries to identify areas that may be subject to flooding.

Winner



- Hydrological Subbasin
- Project Boundary
- I-90
- Water Bodies
- County Boundary
- Drainage



N

0 7.5 15
Miles

SDPW Project

Figure 3.2-2

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3.2.2.1 Crow Lake Alternative

The Federal Emergency Management Agency (FEMA) has not mapped flood hazards in the unincorporated areas of Brule and Jerauld counties; flood insurance rate map (FIRM) panels are not available for review. Aurora County has been mapped and is designated as a flood hazard Zone D on the FIRM panel. A flood hazard Zone D is described as follows:

> *Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.*

3.2.2.2 Winner Alternative

Floodplains and flood hazards in the unincorporated areas of Tripp County are largely unmapped by FEMA. The cities of Winner and Colome (southeast of Winner) have FIRM panels available. No flood hazard zones are mapped within Winner, and Colome has a strip of land running parallel to U.S. Highway 18 designated as a flood hazard Zone A. Zone A flood hazards are described as follows:

> *Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.*

3.2.3 GROUNDWATER RESOURCES

This DEIS characterizes groundwater resources underlying the alternative site boundaries. Where site specific data is limited, the configuration of the groundwater resources in the region is provided.

3.2.3.1 Crow Lake Alternative

The primary aquifers underlying the Crow Lake Alternative are associated with the regional, Northern Great Plains aquifer system. Small, localized and shallow aquifers within the near-surface shale deposits and glacial sediments can also produce groundwater (Terracon 2009a).

The regional aquifer can be anticipated at depths of approximately 900 to 1,250 feet below ground surface (bgs) and is separated from the near-surface glacial sediments by a confining unit associated with portions of the Pierre Shale formation. The groundwater flow direction in the regional aquifer is generally east-northeast (Terracon 2009a).

Many private wells within the Crow Lake Alternative have been advanced in the shallow, localized sand and gravel aquifers associated with Pleistocene glacial deposits. Water encountered in sands and gravels within 200 feet bgs are classified by the USGS as the Crow Lake local aquifers. Water levels reported for the Crow Lake local aquifers ranged from 1.9 to 100 feet bgs. The Crow Lake local aquifer has approximately 190,000 acre-feet of water in storage in Aurora and Jerauld counties and underlies approximately 50 square miles; the aquifer exhibits a strong correlation between precipitation events and groundwater levels (Terracon

2009a). Locally, the uppermost and highly weathered/fractured beds of the Pierre Shale also can yield groundwater to support domestic uses (Terracon 2009a).

3.2.3.2 Winner Alternative

The Winner Alternative is located within an area of south-central South Dakota where the Northern Great Plains and High Plains regional aquifer systems overlap (Terracon 2009b). Groundwater at the site is primarily obtained from the unconsolidated deposits associated with the High Plains aquifer system. Depths to near-surface groundwater at the Winner site were within 50 feet bgs in the majority of the well records. Well depths generally ranged from 28 to 260 feet bgs, and six wells indicated groundwater levels at or near the ground surface (Terracon 2009b).

The near-surface permeable sediments allow direct infiltration of precipitation, recharge to the aquifer and seepage though the beds of streams over the majority of the site. Recharge is rapid where the surficial material consists of poorly consolidated sand, stream-valley deposits of sand and gravel or highly weathered sediments. Recharge is slower where sandstone or local beds of fine grained sediments are at the ground surface. Near the northeastern boundary of the site, near-surface deposits of the Pierre Shale sediments are not as readily permeable (Terracon 2009b).

3.2.4 WETLANDS AND WATERS OF THE UNITED STATES

The Proposed Project area is within the prairie pothole region, as designated by the USFWS. Wetlands, or prairie potholes, are scattered across the landscape throughout much of eastern and south-central South Dakota. Ranging from small lakes to temporary wetlands, these areas perform several important functions, including:

- flood control
- groundwater recharge
- water quality protection
- plant, aquatic and wildlife habitat production

Under Section 404 of the CWA, the USACE has authority to regulate the discharge of dredged and fill material into WUS. WUS include traditional navigable waters and their non-navigable tributaries that typically flow year-round or have flow at least seasonally (*e.g.*, typically three months).

Wetlands, which are special aquatic sites, can be jurisdictional under Section 404 as a subset of WUS. Wetlands, as defined by the EPA and the USACE in the *Wetland Delineation Manual* (Environmental Laboratory 1987), are "those areas that are inundated or saturated by surface or groundwater at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." The USACE will assert jurisdiction over wetlands adjacent to navigable waters and wetlands that directly abut their non-navigable tributaries.

National Wetlands Inventory (NWI) maps, produced by the USFWS and microfilmed by the USGS, provide a cursory evaluation of potential wetland areas. NWI maps are prepared primarily by stereoscopic analysis of high altitude aerial photographs. Potential wetland areas are noted based on vegetation, visible hydrology and geography. Generally, water bodies visible on the high altitude aerial photographs would be designated by the USFWS as “potential” wetland areas. Additionally, field investigations for site characterization in 2008 and 2009 (see **Section 3.4**) identified wetlands as part of the review of biological resources and land uses.

The USFWS has been acquiring conservation easements in the vicinity of the Proposed Project alternatives to support the preservation of grasslands and wetlands habitat. These conservation easements are further discussed in **Sections 3.4** and **3.6.3**.

3.2.4.1 Crow Lake Alternative

Based on the NWI, two wetland classification types are mapped at various locations across the Crow Lake Alternative, including Freshwater Emergent Wetland and Freshwater Pond. **Figure 3.2-3** depicts the NWI indicated wetland areas. **Table 3.2-1** lists the total number of NWI indicated wetland acres in the Crow Lake Alternative.

Table 3.2-1 Wetland Areas within the Crow Lake Alternative

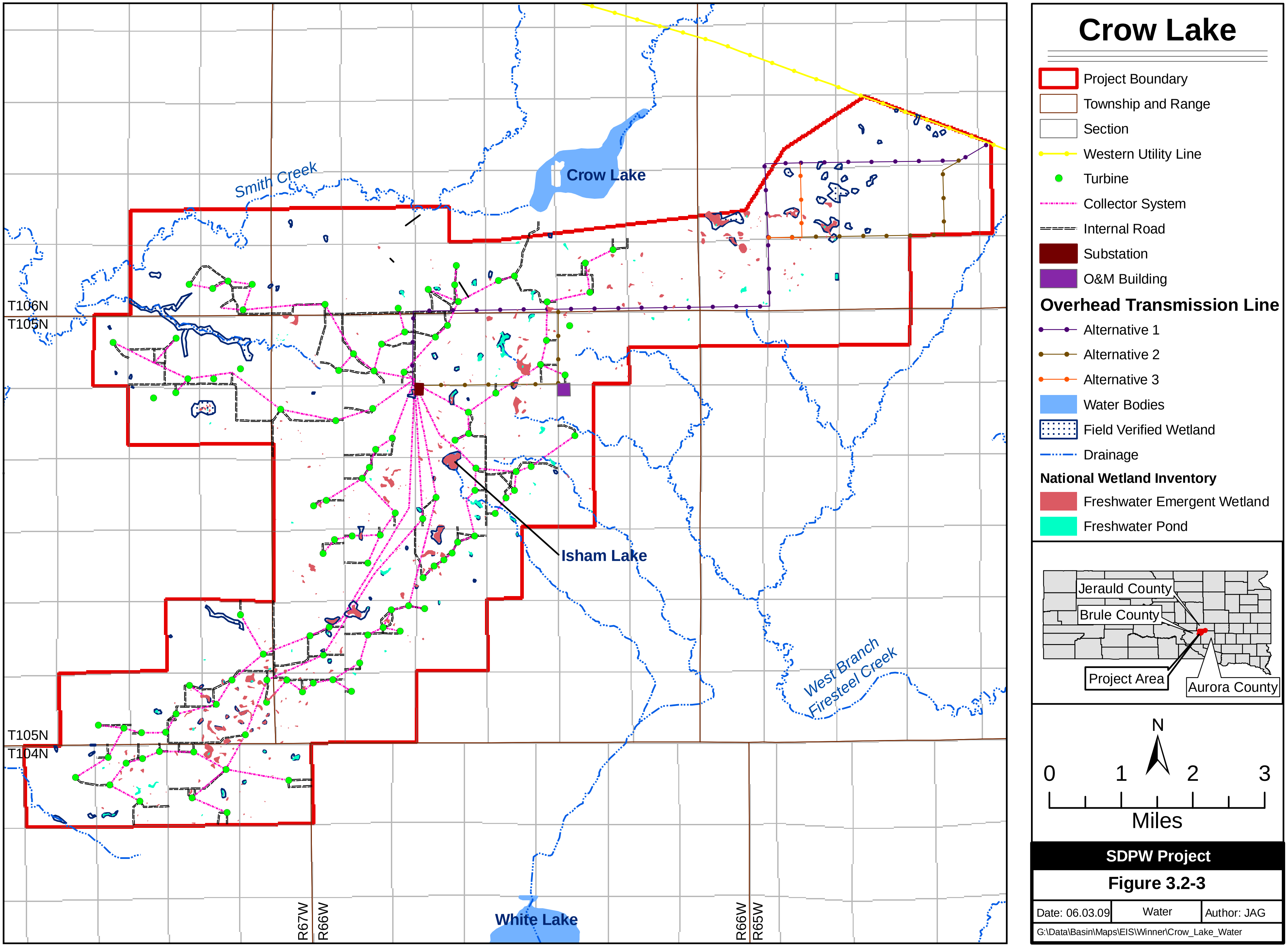
Wetland Type	Area (acres)
Freshwater Emergent Wetland	385
Freshwater Pond	91
Total	476

Source: NWI

As a secondary measurement of the wetlands anticipated within the Crow Lake Alternative, field investigations in 2008 and 2009 identified a total of 517 acres of prairie potholes, stock ponds, wetlands and wetland fringe, as depicted in **Figure 3.2-3** (Tierra EC 2009). **Section 3.4.3.1** further describes the field-identified wetland areas. WUS have not yet been delineated.

3.2.4.2 Winner Alternative

Four wetland classification types are mapped at various locations across the Winner Alternative, including Freshwater Emergent Wetland, Freshwater Forested/Shrub Wetland, Freshwater Pond and Lake. **Figure 3.2-4** depicts the NWI indicated wetland areas. **Table 3.2-2** lists the total area of NWI indicated wetland in the site.



Due to engineering considerations, the transmission line Alternative 1 location includes area outside of the Crow Lake Alternative boundary; this boundary will be revised to include the transmission line route in the FEIS.

Table 3.2-2 Wetland Areas within the Winner Alternative

Wetland Type	Area (acres)
Freshwater Emergent Wetland	1,937
Freshwater Forested/ Shrub Wetland	155
Freshwater Pond	98
Lake	51
Total	2,240

Source: NWI

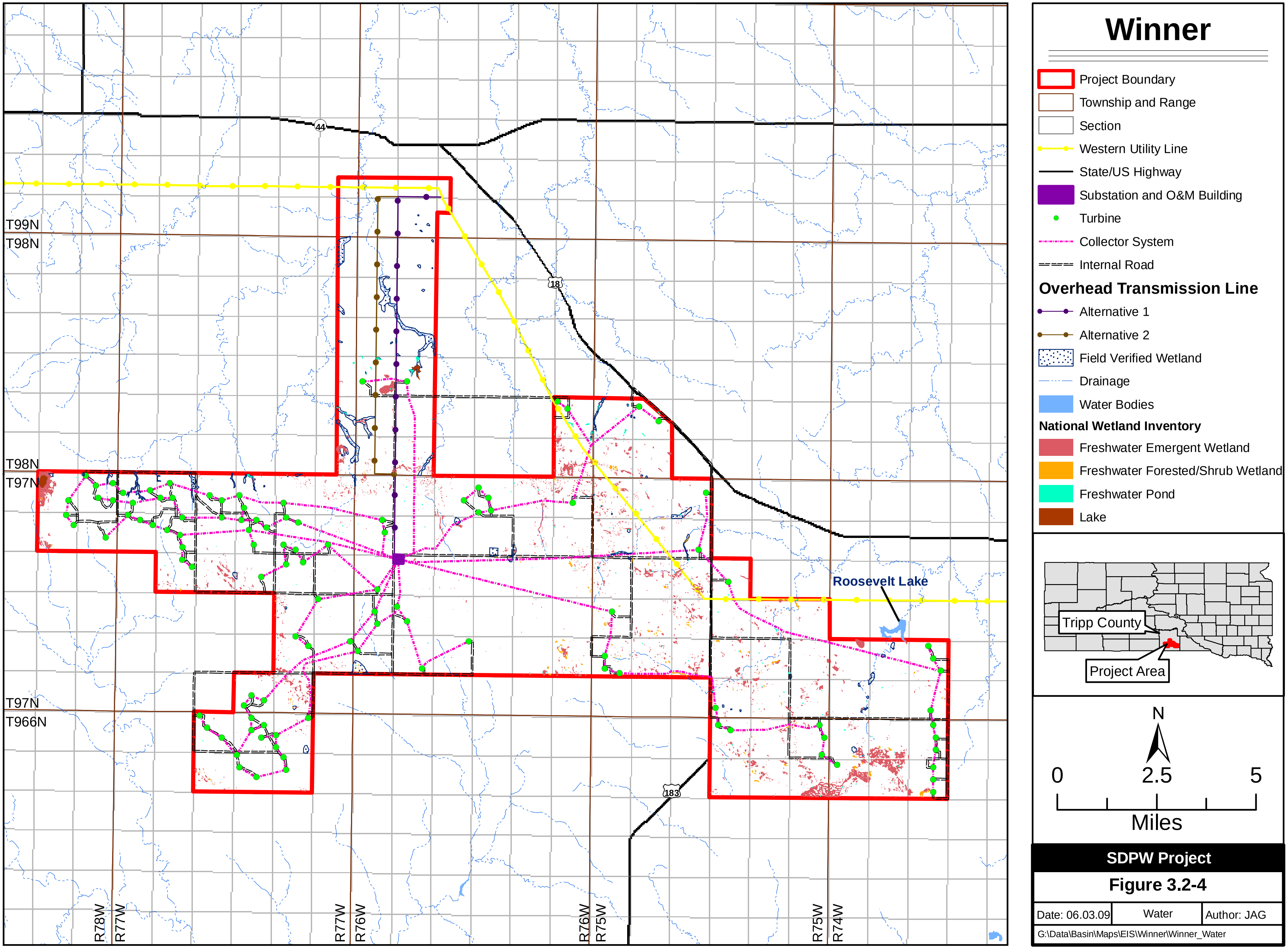
Similar to the Crow Lake Alternative, field investigations in 2008 and 2009 identified a total of 931 acres of deciduous wetland, forested wetland, lake, stock pond, wetland and wet meadow within the Winner Alternative, as depicted in **Figure 3.2-4** (Tierra EC 2009). **Section 3.4.3.2** further describes the field-identified wetland areas. WUS have not yet been delineated.

3.3 CLIMATE CHANGE AND AIR QUALITY

The ROI for climate change and air quality includes areas of immediate disturbance associated with the Proposed Project Components and proposed Federal actions, in association with regional conditions.

3.3.1 REGIONAL CLIMATE AND METEOROLOGY

The Chamberlain Station (Station #024) is the closest weather station to either alternative and it is equidistant to both sites. Between 1971 and 2000, and considering the annual average highs and lows, this station recorded an annual mean high temperature of 79.6 degrees Fahrenheit, an annual mean low temperature of 2.9 degrees Fahrenheit (South Dakota Office of Climate [SDOC] 2009), and an annual mean temperature of 46.7 degrees Fahrenheit. Station #024 receives an average yearly rainfall of 22.35 inches. The annual average surface wind velocity for South Dakota ranges from 10 to 12 miles per hour (mph), as depicted in **Chapter 1**, **Figure 1-1.**



SDPW Project

Figure 3.2-4

Date: 06.03.09 | Water | Author: JAG

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3.3.2 AIR POLLUTANTS

Air quality in South Dakota is regulated by the DENR Air Quality Program, which is responsible for permitting and enforcement. Federal and State laws seek to reduce air pollution to levels shown by research to protect the majority of individuals and reduce overall impacts to ecosystems. The implementation of these laws begins with setting air quality standards, which describe the existing air environment in the Proposed Project area. The EPA sets NAAQS to regulate the emissions of six air pollutants referred to as "criteria pollutants." DENR has adopted the NAAQS for the State air quality program. The criteria pollutants include:

- Carbon monoxide (CO)
- Lead (Pb)
- Nitrogen dioxide (NO_2)
- Ozone (O_3)
- Particulate matter less than 10 (PM_{10}) and 2.5 ($PM_{2.5}$) microns in diameter
- Sulfur dioxide (SO_2)

3.3.3 AMBIENT AIR QUALITY

Both the Crow Lake and Winner alternatives are in attainment for the NAAQS, thus no special mitigation measures are required for new activities.

3.3.4 CLIMATE CHANGE

Carbon dioxide (CO_2) is one of six greenhouse gases (GHGs) that contributes to climate change. CO_2 emissions represent approximately 84 percent of all GHG emissions in the U.S. CO_2 is generated whenever a carbon-based fuel, such as coal, wood, natural gas, or fuel oil is burned. It is the primary GHG emitted from fossil-fired utility boilers, with approximately 41 percent of U.S. carbon emissions (primarily CO_2) coming from power plant sources (Energy Information Administration [EIA] 2009). Other significant sources are automobile and truck exhaust, industrial combustion sources and residential heating sources. Wind-generating stations do not emit CO_2.

Within South Dakota, CO_2 emissions resulting from fossil fuel combustion totaled 13.78 million tons in 2007 (EPA 2009a). Five principal sectors contribute to CO_2 emissions through the combustion of fossil fuels, including commercial, industrial, residential, transportation and electric power. Of these, activities related to the generation of electric power accounted for 2.96 million tons of CO_2 emitted in South Dakota (EPA 2009a).

In addition to CO_2, sulfur hexafluoride (SF_6) is another GHG listed by the Intergovernmental Panel on Climate Change (IPCC). Western's existing substations in the Proposed Project areas use SF_6, a gaseous dielectric, used in high-voltage circuit breakers, switchgears and other electrical equipment, such as circuit breakers. Since 2000, Western has had an aggressive program to identify and repair leaks throughout the transmission system to reduce SF6 emissions. Project personnel would monitor the use, storage and replacement of SF6 to minimize any releases to the environment. The likelihood for accidental release is low, as SF6 gas is supplied in sealed units and is factory-certified not to leak. The activities associated with Western’s proposed Federal action would be done in accordance with Western's environmental protection provisions.

Wind farms and substations do not emit substantial amounts of the other GHGs.

3.4 BIOLOGICAL RESOURCES

3.4.1 REGULATORY FRAMEWORK

3.4.1.1 Federal Statutes

Endangered Species Act

The ESA provides for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The ESA is implemented by two Federal agencies, the USFWS and National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries), which are authorized to list plant and animal species as endangered, threatened or candidates for listing. Section 7 of the ESA imposes an affirmative duty on Federal agencies to ensure that their actions (including permitting) are not likely to jeopardize the continued existence of a listed species or result in the destruction or modification of its habitat.

Migratory Bird Treaty Act

The MBTA makes it illegal for anyone to “pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird. . . or any part, nest, or egg of any such bird” (16 U.S.C. 703).

Bald and Golden Eagle Protection Act

The BGEPA (16 U.S.C. 668-668c) prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" Bald Eagles, including their parts, nests or eggs. The BGEPA provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The BGEPA defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

3.4.1.2 State Statutes

South Dakota Wildlife Diversity Program

The South Dakota Wildlife Diversity Program (South Dakota Codified Laws [SDCL] 34A-2-1, 38-7-1) protects species and habitats that comprise the biological diversity of the State "in a manner that meets the needs and desires of the citizens of the State." Statutory policies are geared toward the conservation of water and soils to help preserve wildlife. The SDGFP maintains the interagency South Dakota Natural Heritage Program (SDNHP) to track species lists for the State.

South Dakota Endangered Species Law

The South Dakota Endangered Species Law (SDCL Ann. 34A-8-1 *et seq.*) covers animals and plants. Listings are based on scientific, commercial and other data. The law does not require recovery plans, critical habitat designation or agency consultation.

3.4.2 STUDY METHODS

The ROI for biological resources is different for vegetation and wildlife. The ROI for vegetation includes areas of direct disturbance (temporary and permanent) associated with the Proposed Project Components. The ROI for wildlife includes all areas within the boundaries, because the Proposed Project could impact wildlife species in areas that extend beyond the footprint for construction (including temporary and permanent disturbance areas) of the Proposed Project Components. This includes lands adjacent to proposed facilities but within the boundaries that are used by wildlife, such as migration corridors.

Biological data was collected from literature searches; agency personnel and reports from USFWS, SDGFP and the SDNHP; ecological reports and databases (*e.g.*, NatureServe, GAP analysis); and field investigations. Biologists from Western, Tierra EC, Western EcoSystems Technology, Inc. (WEST) and Terracon provided regional and site-specific information for biological resources. USFWS correspondence provided input during the Proposed Project scoping (**Appendix C**). Information for Federally-listed species was requested from the USFWS on October 14, 2009; a response was provided on November 12, 2009 (**Appendix C**).

Field investigations were conducted for site characterization in July, September, October and November 2008, and March through July 2009. WEST conducted grouse lek surveys, breeding bird surveys, migratory bird surveys and bat use surveys during the spring and summer of 2009. WEST continued to conduct avian use surveys (until November 2009) and bat use surveys (through October 2009). WEST provided interim survey reports in August 2009, including data for analysis in this DEIS. In addition to the avian and bat use surveys, a PII study (see **Sections 4.4.3.1** and **4.4.3.2, Wildlife, *Birds***) was completed to evaluate potential impacts to biological resources in accordance with the USFWS's *Interim Guidelines on Assessing Wind Impacts to Wildlife* (USFWS 2003). Where feasible, site development, turbine design and operational recommendations were incorporated into the project design, as described in **Chapter 2**.

3.4.3 VEGETATION COMMUNITIES

3.4.3.1 Crow Lake Alternative

Regional Overview

The Crow Lake Alternative is within the Southern Missouri Coteau subregion of the Northern Glaciated Plains Ecoregion (Bryce *et al.* 1998; Omernik 2005). Bailey *et al.* (1995) describe this area as the Eastern Prairie Ecoregion, Mixedgrass Subregion. This region is characterized by elevation ranges of 1,985 to 2,510 feet AMSL. The area is mesic with average annual precipitation in excess of 20 inches. Mixed grasses dominate the native vegetation. Species of wheatgrass (*Agropyron* spp.), needlegrass (*Stipa* spp.) and grama (*Bouteloua* spp.) are common, while woody vegetation is rare and generally limited to drainages. Cropland is also common and consists primarily of corn, small grains and alfalfa. Most of the area is nearly level to undulating glacial till plains with prairie pothole wetlands and moraines. Steep slopes are prevalent adjacent to the major streams. Wetland basin densities in the Prairie Pothole Region (PPR) are some of the highest in the country with densities as high as 83 wetland basins per square mile. The wetland basin density in the Crow Lake area is nine to 10 basins per square mile, some of the lower basin densities in the PPR (Kempema 2007).

Crow Lake Alternative Description

As detailed in **Table 3.4-1** and **Figure 3.4-1**, the Crow Lake Alternative is composed of rolling hills intermixed with mixed-grass prairie, including rangeland, pastureland and Conservation Reserve Program (CRP)/prairie, cropland, wetlands (including stock ponds), farmsteads and patches of deciduous trees (mostly shelterbelts) (Tierra EC 2009). Elevations range from 1,644 feet AMSL in the bottomlands to 1,985 feet AMSL in the northwest portion of the site.

Table 3.4-1 Vegetation Communities in the Crow Lake Alternative

Vegetation Type	Acres	Percentage of Area
Mixed-grass prairie	23,007	64%
Cropland	11,678	33%
Wetlands	517	1%
Farmstead	276	<1%
Shelterbelt	261	<1%
Deciduous forest	82	<1%

Mixed-grass Prairie (including rangeland, pastureland and CRP/prairie)

Mixed-grass prairie accounts for approximately 64 percent (23,007 acres) of the Crow Lake Alternative. Mixed-grass prairie includes rangeland (untilled areas, as well as areas that were tilled at one time but have reverted to grassland), pasture and CRP/prairie. There is very little unbroken sod in the area.

Rangeland (22,222 acres) includes areas of expansive, mostly unimproved land on which native or adapted, introduced plant species are managed for livestock grazing. Some areas contain unbroken sod; however, much of this acreage has been plowed at one time. Dominant herbaceous vegetation includes smooth brome (*Bromus inermis*) and sweet-clover (*Melilotus* spp.), with occasional occurrences of *Carduus* spp., *Artemisia* spp. and various members of the Asteraceae family. In addition to herbaceous plant species, rangeland often contains scattered plains cottonwood (*Populus deltoides*) and various shrub species.

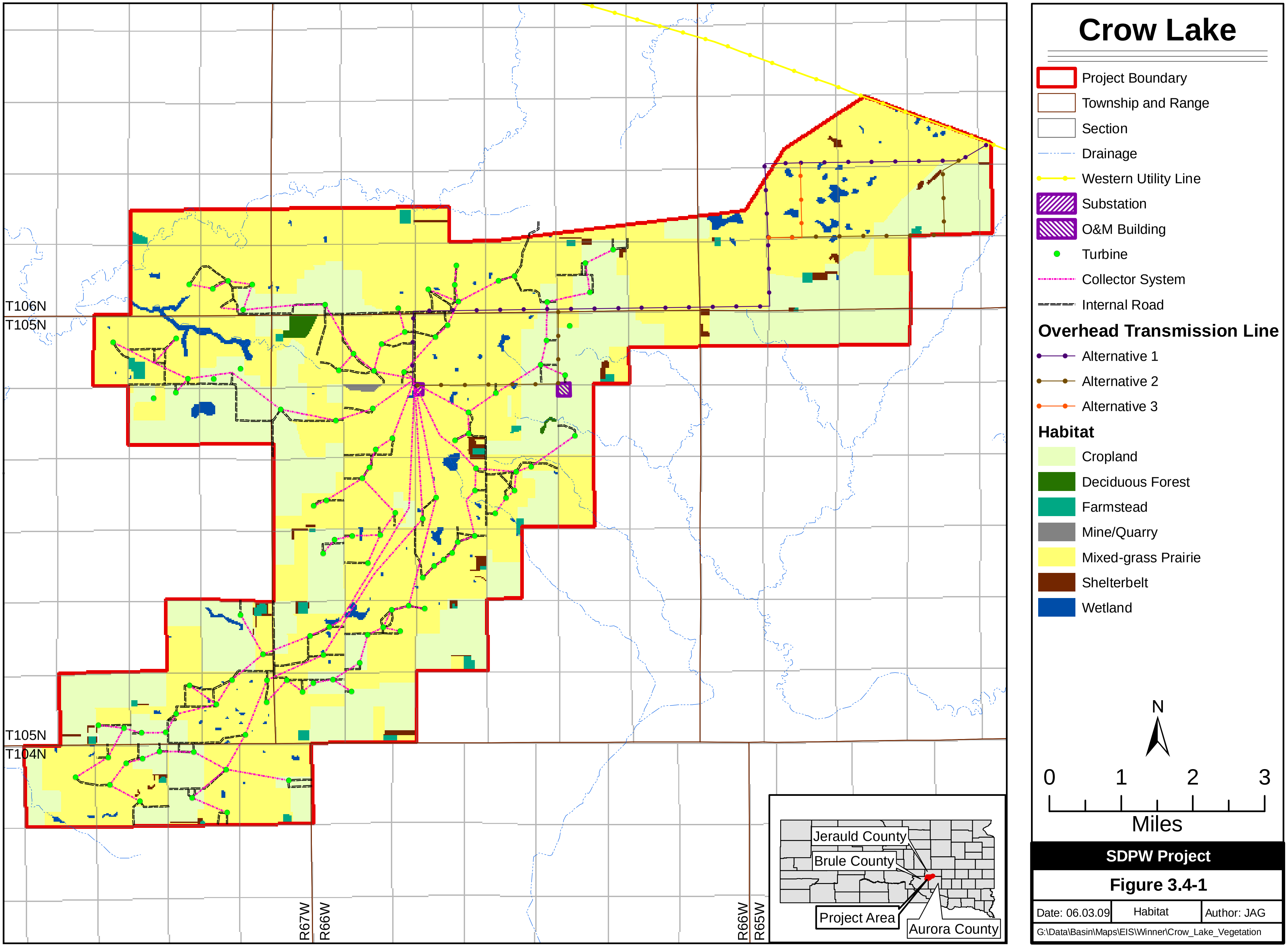
Pasture (692 acres) includes areas where livestock are held in high densities. Herbaceous vegetation is often minimal; where present, the vegetation is often heavily grazed.

CRP/prairie (93 acres) is areas of naturally occurring prairie or planted grasslands where native prairie grasses are dominant. CRP includes areas of cropland that have been removed from crop production for a specific period (usually 10 years) and are planted with cover designed to conserve soil and water. Hay production and livestock grazing are not permitted on CRP land unless specifically allowed during droughts. The Farm Service Agency (FSA) handbook, updated by the USDA in May 2008, expressly forbids the FSA from revealing acreages or locations of CRP; therefore, this information is no longer available so an estimate of CRP lands within the Crow Lake Alternative cannot be made. Based on field observations, the majority of lands in the CRP/prairie category appear to be CRP (previously broken sod), and not naturally occurring prairie (unbroken sod). CRP/prairie is dominated by smooth brome (*Bromus inermis*), prairie beard grass (*Schizachyrium scoparium*), big blue-stem (*Andropogon gerardii*), switch grass (*Panicum virgatum*), Kentucky bluegrass (*Poa pratensis*) and sweet-clover (*Melilotus* spp.).

The USFWS has approximately 1,629 acres of grasslands in five parcels enrolled in the Grassland Easement program within the Crow Lake Alternative (USFWS 2008). Grassland Easements are included in the mixed-grass prairie land use category in **Table 3.4-1**. **Figure 3.4-2** identifies the locations of the Grassland Easements within the area. Grasslands protected under easements are prevented from being permanently converted to cropland or development. Landowners may use the land within the easement for grazing and haying; however, mowing, haying and grass seed harvesting must be delayed until after July 15th of each year. The program allows one wind turbine with associated facilities per 160 acres enrolled. Locating turbines on Grassland Easements requires coordination with the USFWS.

Cropland

Cropland accounts for approximately 33 percent (11,678 acres) of the Crow Lake Alternative. It includes all open space areas where agricultural products are currently in production. This category was further divided into specific cover type classifications based on the previous year's crop type (*i.e.,* row crop or cover crop). Row crops include plantings such as sorghum or corn; cover crops include alfalfa, winter wheat or hay. Many agricultural lands alternate between row and cover crops. Some areas defined as cropland are also used as rangeland during parts of the year.



Due to engineering considerations, the transmission line Alternative 1 location includes area outside of the Crow Lake Alternative boundary; this boundary will be revised to include the transmission line route in the FEIS.

Wetlands (including stock ponds)

Wetlands account for slightly over one percent (517 acres) of the Crow Lake Alternative. Prairie potholes describe the naturally occurring depressional wetlands where native and non-native hydrophytic vegetation persists. Dominant vegetation includes prairie cord grass (*Spartina pectinata*), reed canary grass (*Phalaris arundinacea*), narrow-leaved cattail (*Typha angustifolia*) and river bulrush (*Bolboschoenus fluviatilis*).

Stock ponds are areas where ranchers have bermed natural drainage features or seasonal wetlands to create a persistent water supply for livestock. These areas are often heavily grazed and do not generally contain a perimeter of hydrophytic vegetation.

The USFWS has approximately 2,836 acres of wetlands and adjacent uplands in 15 parcels enrolled in the Wetland Easement program within the Crow Lake Alternative (USFWS 2008). Wetland Easement areas are not displayed in **Table 3.4-1,** but are accounted for in both the mixed-grass prairie and wetlands area estimates. They are not displayed as wetland easements because wetland easements include both habitat types and the data do not distinguish these acreages by parcel.

Farmstead, Shelterbelt and Deciduous Forest

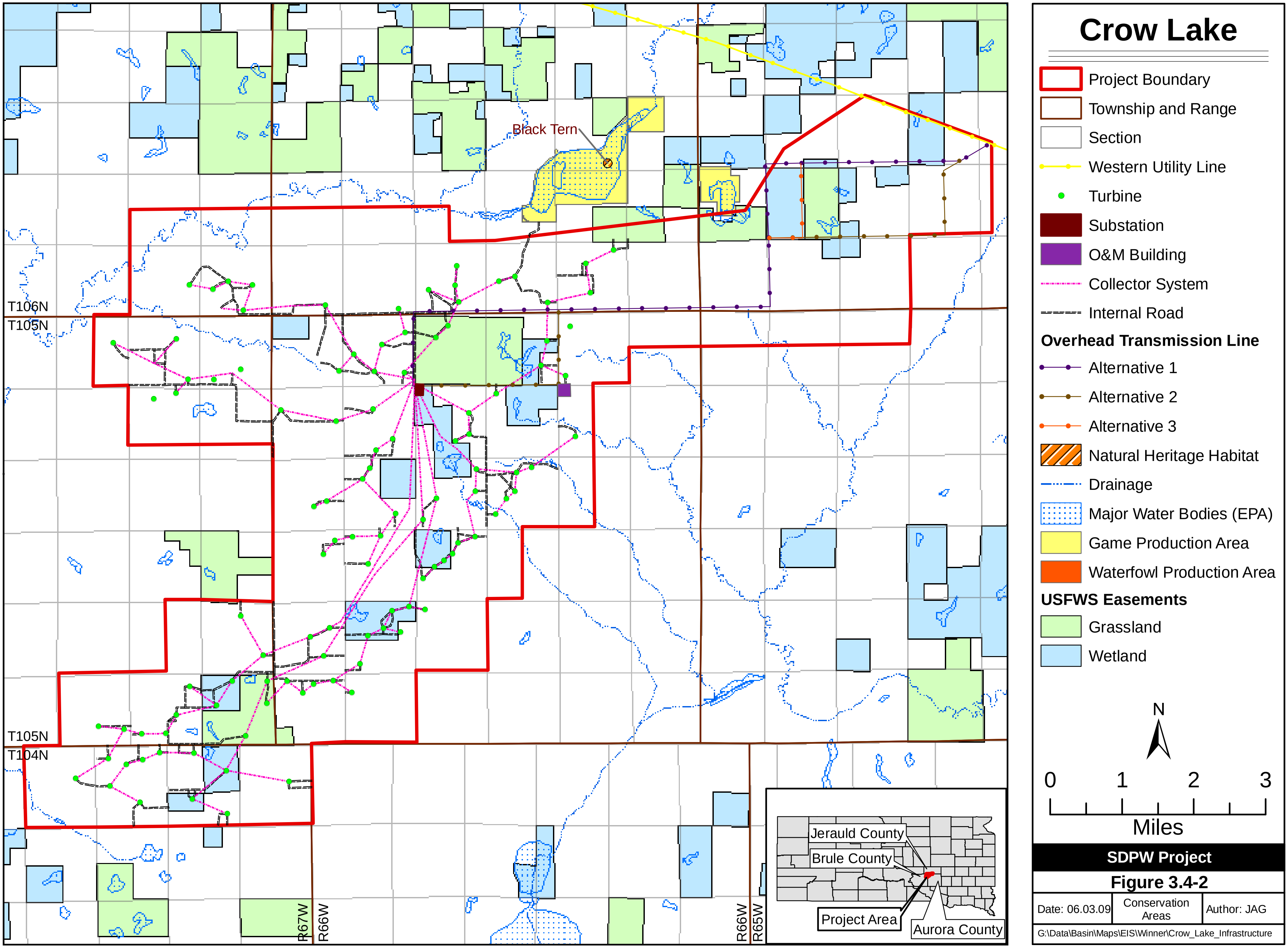
Farmsteads account for less than one percent (276 acres) of the Crow Lake Alternative. Farmsteads include developed areas of land with various structures devoted to residential, commercial or industrial practices. These areas are adjacent to pasture or rangeland and are scattered throughout the site.

Shelterbelts account for less than one percent (261 acres) of the Crow Lake Alternative. Shelterbelts are trees or shrubs planted in one or more rows that provide shelter from wind or protect soil from erosion. Shelterbelts are typically found around the edges of fields, pastures and/or farmsteads. Most of the shelterbelts are associated with farmsteads. The most commonly observed tree species within the shelterbelts is eastern red cedar (*Juniperus virginiana*); plains cotton wood (*Populus deltoides*) and wild plum (*Prunus americana*) are also present.

Deciduous forest accounts for less than one percent of the Crow Lake Alternative. These are areas of dense, naturally occurring tree species. In upland areas, plains cottonwoods (*Populus deltoides*) are most abundant, with occurrences of eastern red-cedar (*Juniperus virginiana*), Siberian elm (*Ulmus pumila*), green ash (*Fraxinus pennsylvanica*) and wild plum (*Prunus americana*). Deciduous forest is often located as islands within rangeland.

Invasive and Noxious Plants

In South Dakota, invasive species include declared pests and noxious weeds. These are defined as species which the South Dakota Weed and Pest Control Commission has designated as sufficiently detrimental to the State to warrant enforcement of control measures (Administrative Rule [AR] 12:62:02:01). South Dakota has documented 27 invasive species under this rule.



Due to engineering considerations, the transmission line Alternative 1 location includes area outside of the Crow Lake Alternative boundary; this boundary will be revised to include the transmission line route in the FEIS.

Table 3.4-2 South Dakota Invasive Plant Species Documented in Jerauld, Aurora or Brule Counties

Common Name	Scientific Name
Absinth wormwood	*Artemisia absinthium*
Hoary cress	*Cardaria draba*
Plumeless thistle	*Carduus acanthoides*
Musk thistle	*Carduus nutans*
Russian knapweed	*Centaurea repens*
Canada thistle	*Cirsium arvense*
Field bindweed	*Convolvulus arvensis*
Leafy spurge	*Euphorbia esula*
Perennial sow thistle	*Sonchus arvensis*
Puncturevine	*Tribulus terrestris*
Common mullein	*Verbascum thapsus*

Source: South Dakota Department of Agriculture 2008

Table 3.4-2 presents the 11 invasive species documented in Jerauld, Aurora and Brule counties. The distribution of invasive species in the Crow Lake Alternative is unknown at this time.

Federally-listed Species

No Federally-listed plant species are known to occur within Aurora, Brule or Jerauld counties (USFWS 2009a).

State-Listed Species

No rare, threatened or endangered plant species tracked by the SDNHP are known to occur in the Crow Lake Alternative (SDNHP 2009).

3.4.3.2 Winner Alternative

Regional Overview

The Winner Alternative is in the Great Plains Steppe Ecoregion (Omernik 2005). This ecoregion includes approximately 25 million acres. This ecoregion is characterized by elevations from approximately 1,644 to 1,985 feet AMSL. Topography is gently sloping to rolling with well-drained shale plains. The area is dry mesic to mesic with average annual precipitation between 12 and 23 inches. Mixed grasses dominate the vegetation. The Winner Alternative is in the Keya Paha Tablelands and Ponca Plains subregions (Bryce *et al.* 1998). The Keya Paha Tablelands Subregion (16”-20” annual precipitation) covers the western half of the Winner Alternative. Natural vegetation includes blue grama, sideoats grama, western wheatgrass, little bluestem and needleandthread. The Ponca Plains Subregion covers the eastern half of the Winner Alternative, and is more mesic (20”-22” annual precipitation) than the Keya Paha Tablelands Subregion. Natural vegetation consists of mixed-grass prairie containing little bluestem, prairie sandreed, green needlegrass and needleandthread. Wetland densities are similar to the Crow Lake Alternative and are relatively low.

Winner Alternative Description

The Winner Alternative is predominantly in the mixed-grass prairie zone and is intermixed with mixed-grass prairie (including rangeland, pastureland and CRP/prairie), cropland, wetlands (including herbaceous wetlands, forested wetlands, stock ponds and lakes), deciduous forests, farmsteads and shelterbelts (**Table 3.4-3** and **Figure 3.4-3**). Elevations range from 1,985 feet AMSL in the bottomlands at the northern extent of the Winner Alternative to 2,510 AMSL at the western extent of the area.

Table 3.4-3 Vegetation Communities in the Winner Alternative

Vegetation Type	Acres	Percentage of Area
Mixed-grass prairie	53,925	65%
Cropland	24,450	29%
Wetlands	931	1%
Farmstead	1,351	1.5%
Shelterbelt	1,261	1.5%
Deciduous forest	1,464	2%

Mixed-grass Prairie (including rangeland, pastureland and CRP/prairie)

Mixed-grass prairie accounts for approximately 65 percent (53,925 acres) of the Winner Alternative. Mixed-grass prairie includes rangeland, pasture and CRP/prairie. A small percentage of the Winner Alternative is unbroken sod, although there is more than the Crow Lake Alternative.

Rangeland (51,432 acres) defines areas of expansive, mostly unimproved land on which native or adapted introduced plant species are managed for livestock grazing. Some areas contain unbroken sod; however, much of this acreage has been plowed at one time. The most common taxa include smooth brome, sweet-clover, *Carduus* spp., *Artemisia* spp., various members of the Asteraceae family, switch grass (*Panicum virgatum*), prairie beard grass (*Schizachyrium scoparium*), *Muhlenbergia* spp., *Sonchus* spp., hoary verbena (*Verbena stricta*), *Agropyron* spp., *Trifolium* spp. and bull thistle (*Cirsium vulgare*).

Pasture (1,282 acres) defines areas where animals are held in high densities. Herbaceous vegetation is often minimal; where present, the vegetation is often heavily grazed.

CRP/prairie (1,211 acres) defines areas of naturally occurring prairie or planted grasslands where native prairie grasses are dominant. As explained above, the 2008 USDA FSA handbook expressly forbids revealing acreages or locations of CRP; therefore, this information is no longer available so an estimate of CRP lands within the Winner Alternative cannot be made. Based on field observations, the majority of lands in the CRP/prairie category appear to be CRP (previously broken sod), and not naturally occurring prairie (unbroken sod). CRP/prairie is dominated by prairie beard grass with switch grass and yellow Indian grass (*Sorghastrum nutans*) as secondary dominants. Other species include prairie beard grass, goldenrod species

(*Solidago* spp.), evening-primrose (*Oenothera* spp.), *Juncus* spp., hoary verbena (*Verbena stricta*), *Artemisia* spp. and various members of the Asteraceae family.

The USFWS has approximately 220 acres of grasslands in one parcel enrolled in the Grassland Easement program within the Winner Alternative and no Wetland Easements (USFWS 2008). The Grassland Easement is included in the mixed-grass prairie land use category in **Table 3.4-3** and **Figure 3.4-4**.

Cropland

Cropland accounts for approximately 29 percent (24,450 acres) of the Winner Alternative. Cropland classifications are the same as described in **Section 3.4.3.1**.

Wetlands (including deciduous wetland, forested wetland, lake, stock pond, wetland and wet meadow)

Wetlands account for slightly over one percent (931 acres) of the Winner Alternative. A variety of wetland complexes, composed of wet meadow, shrub-carr and deciduous wetland forest communities are located within the site. The deciduous wetland communities are dominated by plains cottonwood; the wet meadow communities are dominated by prairie cord grass, switch grass, river bulrush, reed canary grass, narrow-leaved cattail and *Juncus* spp. The shrub-carr communities are dominated by willow (*Salix* spp.) and olive species (*Elaeagnus* spp.). The forested wetland communities are dominated by cottonwood and willow species (*Salix* spp.). These vegetation communities are often within rangeland.

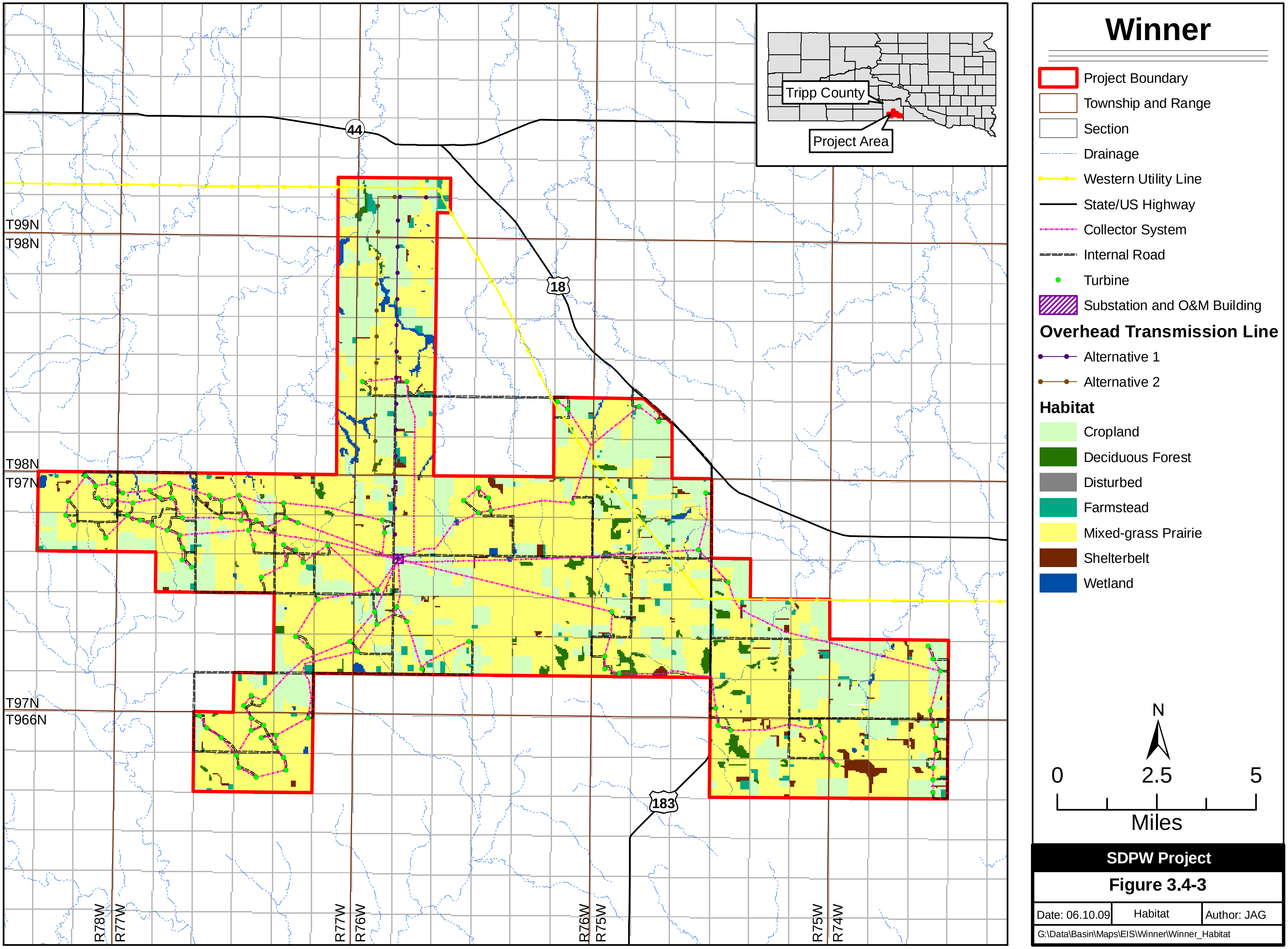
Stock ponds are areas that are bermed (natural drainage features or seasonal wetlands) to create a persistent water supply for livestock. These areas are often heavily grazed and do not contain a perimeter of hydrophytic vegetation.

Deciduous Forest

Deciduous forest accounts for approximately 2 percent (1,464 acres) of the Winner Alternative. This designation describes areas of dense, naturally occurring tree species. In upland areas, plains cottonwood is most abundant; occurrences of eastern red-cedar, Siberian elm, box elder (*Acer negundo*), green ash and wild plum are also present. This vegetation community is often islands within rangeland.

Farmstead and Shelterbelt

Farmsteads account for approximately 1.5 percent (1,351 acres) of the Winner Alternative and are similar to those described in **Section 3.4.3.1**. Shelterbelts account for approximately 1.5 percent (1,261 acres) of the Winner Alternative. Species composition of the shelterbelts is similar to that seen at Crow Lake.



SDPW Project

Figure 3.4-3

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Invasive and Noxious Plants

Table 3.4-4 presents the 12 invasive species documented in Tripp County. The distribution of invasive species in the Winner Alternative is unknown.

Table 3.4-4 South Dakota Invasive Plant Species Documented in Tripp County

Common Name	Scientific Name
Hoary cress	*Cardaria draba*
Plumeless thistle	*Carduus acanthoides*
Musk thistle	*Carduus nutans*
Diffuse knapweed	*Centaurea diffusa*
Spotted knapweed	*Centaurea maculosa*
Russian knapweed	*Centaurea repens*
Canada thistle	*Cirsium arvense*
Bull thistle	*Cirsium vulgare*
Leafy spurge	*Euphorbia esula*
Perennial sow thistle	*Sonchus arvensis*
Common mullein	*Verbascum thapsus*

Source: South Dakota Department of Agriculture 2008

Federally-listed Species

No Federally-listed plant species are known to occur within Tripp County (USFWS 2009a).

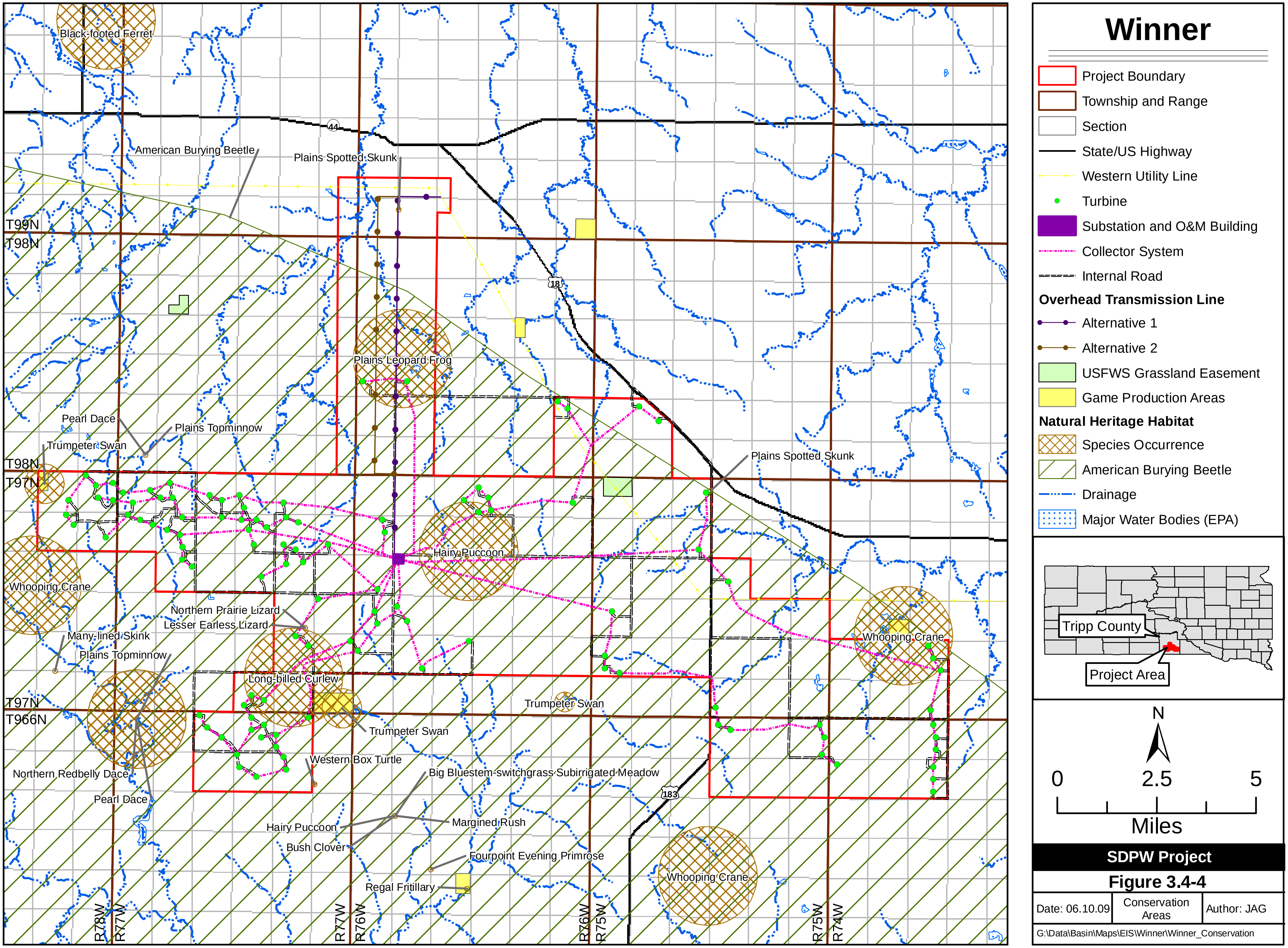
State-Listed Species

No rare, threatened or endangered plant species tracked by the SDNHP are known to occur in the Winner Alternative (SDNHP 2009).

3.4.4 WILDLIFE

The ROI evaluated for wildlife resources encompasses all areas within the boundaries of the Proposed Project alternatives. As the Proposed Project may impact wildlife species in areas that extend beyond the construction footprint of the Proposed Project Components (including temporary and permanent disturbance areas), adjacent lands utilized by wildlife, such as migration corridors, are also included. The ROI for wildlife is greater than the ROI for vegetation because wildlife species move in and out of the Proposed Project alternatives. Extending the ROI ensures that all species are evaluated. The analysis of existing conditions and potential effects from the Proposed Project are based on field studies and the *USFWS PII Score for PrairieWinds SD1* (see **Sections 4.4.3.1** and **4.4.3.2, Wildlife, *Birds***) (Terracon 2008b).

This section is based on information contained within Reference (Lake Andes), Crow Lake, Winner, and Fox Ridge Project Sites Central, South Dakota (Terracon 2008b), PrairieWinds SD1, Inc. Project Compilation of Resource Technical Memorandums (Terracon 2009a and 2009b), Wildlife Studies for the PrairieWinds SD1 Crow Lake Wind Resource Area Aurora, Brule, and Jerauld Counties, South Dakota (WEST 2009a), Wildlife Studies for the PrairieWinds SD1 Winner Wind Resource Area Tripp County, South Dakota (WEST 2009b), and Prairie Winds Vegetation Mapping, NRC Project # 009-0044-01, Portions of Jerauld, Aurora, Brule and



SDPW Project

Figure 3.4-4

Date: 06.10.09 | Conservation Areas | Author: JAG

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Tripp Counties, South Dakota (Tierra EC 2009). Where additional sources of information have been used to evaluate the potential impacts associated with the Proposed Project, those sources have been cited.

3.4.4.1 Crow Lake Alternative

Terrestrial fauna within the Crow Lake Alternative are characteristic of mixed grasslands within the PPR. Fertile soils and high wetland basin density provide an abundance of forage and habitat cover for species of small mammals, amphibians, reptiles and birds, although wetland density is relatively low at the Crow Lake Alternative when compared to the PPR (Kempema 2007). Wildlife shares the region with cattle and other livestock. Agricultural practices have reduced the amount and continuity of prairie and wetland habitat. Smaller patches of prairie and wetland are now often intermixed with woody species in tree rows and shelterbelts. A list of wildlife species observed during field surveys in 2008 and 2009 is provided in **Appendix C, Table C-1.** A total of 100 bird species, 12 mammal species and one amphibian were observed.

Hunting is a popular recreational activity in and around the Crow Lake Alternative. Game species pursued most frequently include pheasants and other upland gamebirds, white-tailed deer, fox, coyotes and waterfowl. Review of State and Federal databases indicates that there are no WPAs, State Game Production Areas (GPA) or Walk-in Areas within the Crow Lake Alternative (SDGFP 2009a and 2009b) (**Figure 3.4-2**).

<u>Mammals</u>

Habitat models produced by the South Dakota GAP Analysis Program (Smith *et al.* 2001) were consulted to identify common wildlife species that may occur within the Crow Lake Alternative.

In addition to the species observed, the GAP analysis predicts mammals including fox (*Vulpes vulpes*), bobcat (*Lynx rufus*), opossum (*Didelphidae*), raccoon (*Procyon lotor*) and those listed in **Appendix C, Table C-2**. Small burrowing mammals, such as shrews, voles, mice and gophers, use soft soils for denning and cover. Game species include pronghorn (*Antilocapra americana*), mule deer and white-tailed deer. White-tailed deer are considered common in the area.

Bat species reside in and migrate through the region. Thirteen species of bats are documented in South Dakota, seven of which may occur in the Crow Lake Alternative (SDGFP 2004; SDGFP 2007; Kempema 2007)(**Table 3.4-5).**

Specific information regarding roosting, breeding, foraging and migration is unknown for bats in the Crow Lake Alternative. Areas adjacent to pothole lakes and wetlands are mesic and support cover and foraging habitat for mammal species. Peaks in insect hatches during warm season months provide a good prey base for many mammals. Bat use surveys were performed from May 1 to October 15, 2009. Results were not available at the time of publication of this DEIS but will be included in the FEIS. The surveys are being performed using Anabat, a system to identify and survey bats by detecting and analyzing their echolocation calls.

Table 3.4-5 Bat Species that May Occur within the Crow Lake Alternative

Common Name	Scientific Name	Type of Residency	Ranking
Northern myotis	*Myotis septentrionalis*	Year-round	Apparently secure/rare or local range (G4/S3)
Silver-haired bat	*Lasionycteris noctivagans*	Summer	Secure/apparently secure (G5/S4)
Little brown myotis	*Myotis lucifugus*	Year-round	Secure (G5/S5)
Western small-footed myotis	*Myotis ciliolabrum*	Year-round	Secure (G5/S5)
Big brown bat	*Eptesicus fuscus*	Year-round	Secure (G5/S5)
Eastern red bat	*Lasiurus borealis*	Summer	Secure (G5/S5)
Hoary bat	*Lasiurus cinereus*	Summer	Secure (G5/S5)

Source: SDGFP 2004, 2007
Ranks: G5/S5 – Demonstrably secure, though it may be quite rare in parts of its range
G4/S4 – Apparently secure, though it may be quite rare in parts of its range
S3 – Either very rare and local throughout its range, or found locally

<u>Reptiles and Amphibians</u>

Common reptiles include the common garter snake (*Thamnophis sirtalis*), plains garter snake (*Thamnophis radix*), plains hognose snake (*Heterodon nasicus*), fox snake (*Elaphe vulpine*), the western painted turtle (*Chrysemys picta belli*) and snapping turtle (*Chelydra serpentina*). Amphibians such as the northern leopard frog (*Rana pipiens*), American toad (*bufo americanus*) and tiger salamander (*Ambystoma tigrinum*) are also likely to be present. Habitat for these species includes open agricultural and grasslands, hedgerows and wet lowlands. The density of reptiles and amphibians is considered similar to that of the surrounding areas, as the Crow Lake Alternative does not contain unique habitats.

<u>Birds</u>

Mixed grasslands and the PPR intersect many avian migratory routes and provide breeding grounds for birds. Wetland basins are highly productive and provide birds with ample resources for reproduction. The resulting mosaic of grassland and wetland basins and linear wetland corridors makes the Crow Lake Alternative an important migration route for birds (Kempema 2007). Bird species that were observed in the area during surveys are listed in **Appendix C, Table C-2**.

Bird Survey Results

Intact mixed-grass prairie in the Crow Lake Alternative provides suitable habitat for many resident and migratory bird species. Avian use surveys were conducted in 2009 to estimate temporal and spatial distributions of birds in the area. Migratory bird surveys (fixed point counts) were conducted from mid-March through late-May 2009. Breeding bird surveys (transect surveys) were conducted from early June to early July 2009. Collectively, field surveys recorded 5,002 individual birds. Aerial grouse lek surveys were also conducted.

Preliminary results for migratory bird surveys indicate a total of 60 unique bird species; a total of 2,178 individual birds were recorded (**Appendix C, Table C-2 and Table C-3**). Fifty-eight individual raptors in 56 groups were recorded (2.7 percent of overall bird observations), representing eight species. Northern Harrier and Red-tailed Hawk were the most frequently observed raptor species. Waterfowl were by far the most abundant bird type comprising 48.4 percent of observations. Canada Geese (*Branta canadensis*) and Mallards (*Anas platyrhynchos*) were the most commonly observed waterfowl. Passerines were the second most abundant bird type, accounting for 24.5 percent of overall bird observations, with Red-winged Blackbird (*Agelaius phoeniceus*) and Western Meadowlark (*Sturnella neglecta*) being the most commonly observed passerine species (WEST 2009a).

A total of 2,824 individual bird observations were recorded during breeding bird surveys, representing 59 unique species. Cumulatively, four species (6.8 percent of all species) accounted for 85.4 percent of observations: Brown-headed Cowbird, Western Meadowlark, Grasshopper Sparrow and Red-winged Blackbird, which are species typical of open grassland habitats. Over half of the birds observed during breeding bird surveys were blackbirds and orioles. Woodland and wetland birds were also observed, but were less abundant than grassland species.

Upland game bird species known to occur in the Crow Lake Alternative include Ring-necked Pheasant, Greater Prairie Chicken and Sharp-tailed Grouse. Ring-necked Pheasant habitat includes primarily mixed grasses and cropland. There are few intact native grasslands in the area; these areas provide habitat for Sharp-tailed Grouse and Greater Prairie Chicken. Sharp-tailed Grouse and Greater Prairie Chicken were documented during spring and summer surveys (WEST 2009a; Tierra EC 2009). Five grouse leks were identified during aerial surveys. Four are within the Crow Lake Alternative and one is immediately adjacent to the site. Two of the leks were confirmed to species (one Sharp-tailed Grouse and one Greater Prairie Chicken). The remaining three could not be identified to species (WEST 2009a).

Waterfowl utilize the wetland basins in and adjacent to the Crow Lake Alternative for nesting, foraging and migratory stopover. WPAs are USFWS preserves with quality habitat often used by waterfowl. There are no WPAs within the Crow Lake Alternative; the closest WPA is approximately seven miles to the southeast. Wetlands, streams, ponds and lakes in and near the site provide nesting, foraging and cover habitat for several shorebird species. Two groups of Sandhill Cranes (18 individuals) were observed at the Crow Lake Alternative (WEST 2009a). Sandhill Cranes are often used as a surrogate species for Whooping Cranes because they use similar habitat types. Preliminary results from one year of data collection indicate that the number of individuals observed indicates that habitat suitability for Sandhill Cranes is low; more data collection is needed to confirm this.

Based on the results from other wind resource areas, a ranking of seasonal mean raptor use was developed (WEST 2009a). Raptor use at the Crow Lake Alternative is 0.35 birds per plot per survey. Raptor use at sites around the United States is between 1.65 and 0.1 birds per plot per survey (WEST 2009a). Although habitats in these wind resource areas are not necessarily the same as those at the Crow Lake Alternative, they provide the best available comparison for raptor use. Based on this analysis, raptor use is relatively low at the Crow Lake Alternative.

The Crow Lake Alternative occurs in the Central Flyway, a major migration corridor through the United States. Avian use surveys conducted in the Crow Lake Alternative indicate that spring and fall migration of songbirds, waterfowl and raptors occurs in the region. There are no topographic features, such as mountain passes or large rivers, which funnel or direct migratory paths to the area or certain portions of the area. Both raptors and songbirds migrate along a broad front throughout the region. Topographic relief in the area is primarily associated with the ridgetop that runs through the site from the southwest portion to the northeast portion. This ridge may provide a source of updrafts that could be used by soaring raptors. Concentrated prey sources, specifically waterfowl, fluctuate seasonally with migrations. Concentrations of waterfowl are expected to be higher in the spring and fall, so raptor populations may increase during those periods. Roosting trees are limited in the area.

Nesting habitat in the Crow Lake Alternative is limited for above ground nesting raptor species and includes scattered trees, tree rows and shelterbelts. No cliffs or rock outcrops were identified during field studies. Ground-nesting raptors likely nest in areas of continuous grassland habitats within the Crow Lake Alternative. Field studies did not reveal raptor nests within the area (WEST 2009a; Tierra EC 2009), although it is likely that raptors nest here.

3.4.4.2 Winner Alternative

Terrestrial fauna within the Winner Alternative are characteristic of mixed grasslands within the mixed-grass prairie zone. Fertile soils provide an abundance of forage and habitat cover for many species of small mammals, amphibians, reptiles and birds. Wetlands provide habitat for many species, although wetland densities are relatively low when compared to the region. Wildlife shares the region with cattle and other livestock. Agricultural practices have reduced the amount and continuity of prairie and wetland habitat. As a result, patches of habitat have become smaller and are often intermixed with woody species in tree rows and shelterbelts. A list of wildlife species observed during field surveys in 2008 and 2009 is provided in **Appendix C, Table C-4**. A total of 98 bird species, 12 mammal species, two reptile species and two amphibian species were observed.

Hunting is a popular recreational activity in and around the Winner Alternative. Game species pursued most frequently include pheasants and other upland gamebirds, white-tailed deer, fox, coyotes and waterfowl. Review of State and Federal databases indicates that there are no Waterfowl Production Areas or Walk-in Areas within the Winner Alternative (SDGFP 2009a and 2009b). The Little Dog Ear Lake GPA is located in the western portion of the site and is approximately 77 acres (**Figure 3.4-4**).

<u>Mammals</u>

Common mammal species residing in the Winner Alternative are similar to those described in **Section 3.4.4.1**.

Bat species reside and migrate through the region. There are 13 species of bats documented in South Dakota, seven of which may occur in the area (SDGFP 2004; SDGFP 2007; Kempema 2007) (**Table 3.4-6**).

Specific information regarding roosting, breeding, foraging and migration is unknown for bats in the Winner Alternative. Areas adjacent to lakes and wetlands are mesic and support cover and foraging habitat for mammal species. Peaks in insect hatches during warm season months provide a good prey base for many mammals. Bat use surveys were performed from May 1 to October 15, 2009. Results were not available at the time of publication of this DEIS but will be included in the FEIS. The surveys are performed using Anabat, a system to identify and survey bats by detecting and analyzing their echolocation calls. The results will be published in the FEIS.

Reptiles and Amphibians

Common reptile and amphibian species residing in the Winner Alternative are similar to those described in **Section 3.4.4.1**. Habitat for these species includes open agricultural and grasslands, hedgerows and wet lowlands. The density of reptiles and amphibians is considered similar to that of the surrounding areas, as the Winner Alternative does not contain unique habitats.

Table 3.4-6 Bat Species that May Occur within the Winner Alternative

Common Name	Scientific Name	Type of Residency	Ranking
Northern myotis	*Myotis septentrionalis*	Year-round	Apparently secure/rare or local range (G4/S3)
Silver-haired bat	*Lasionycteris noctivagans*	Summer	Secure/apparently secure (G5/S4)
Little brown myotis	*Myotis lucifugus*	Year-round	Secure (G5/S5)
Western small-footed myotis	*Myotis ciliolabrum*	Year-round	Secure (G5/S5)
Big brown bat	*Eptesicus fuscus*	Year-round	Secure (G5/S5)
Eastern red bat	*Lasiurus borealis*	Summer	Secure (G5/S5)
Hoary bat	*Lasiurus cinereus*	Summer	Secure (G5/S5)

Source: SDGFP 2004, 2007
Ranks: G5/S5 – Demonstrably secure, though it may be quite rare in parts of its range
G4/S4 – Apparently secure, though it may be quite rare in parts of its range
S3 – Either very rare and local throughout its range, or found locally

Birds

Bird species observed in the Winner Alternative are listed in **Appendix C, Table C-5**.

Bird Survey Results

Intact mixed-grass prairie in the Winner Alternative provides suitable habitat for many resident and migratory bird species. Avian use surveys were conducted in 2009 to estimate temporal and spatial distributions of birds in the area. Fixed point count migratory bird surveys were conducted from early-April through late-May 2009. Transect surveys for breeding birds were conducted from early-June to early-July 2009. Collectively, field surveys recorded 3,455 individual birds.

Preliminary results for migratory bird surveys indicate a total of 58 unique bird species. A total of 1,223 individual birds were recorded (**Appendix C, Table C-5 and Table C-6**). Thirty individual raptors in 27 separate groups were recorded (2.2 percent of overall bird observations), representing seven species. Northern Harrier was the most frequently observed raptor species. Passerines were the most abundant bird type comprising 45.1 percent of observations, primarily due to high numbers of Red-winged Blackbird and Western Meadowlark. Upland gamebirds were the second most abundant bird type, accounting for 18.8 percent of observations, with primarily Ring-necked Pheasant. Waterbirds were also relatively abundant compared to other birds types with 115 birds observed in eight separate groups. The most abundant waterbird species was Double-crested Cormorant (WEST 2009b).

A total of 2,232 individual bird observations within 1,744 separate groups were recorded during breeding bird surveys, representing 53 unique species. Cumulatively, six species (11.3 percent of all species) composed 67.6 percent of the individual observations: Brown-headed Cowbird, Western Meadowlark, Red-winged Blackbird, Savanna Sparrow, Bobolink and Upland Sandpiper. Blackbirds and orioles were the most abundant passerine subtype, accounting for nearly half of all observations (WEST 2009b).

Upland game bird species are the same as at the Crow Lake Alternative (WEST 2009b; Tierra EC 2009), although habitats for these species are more abundant because the Winner Alternative has larger areas of intact grasslands. Eight grouse leks were located and confirmed. Two of the confirmed leks were verified as Greater Prairie Chicken. The other six leks could not be confirmed to species (WEST 2009b).

There are no WPAs within or near the area. No Sandhill Cranes were observed while conducting surveys at the Winner Alternative (WEST 2009b). Sandhill Cranes are often used as a surrogate species for Whooping Cranes because they use similar habitat types. From one year of data collection, the number of individuals observed indicates that habitat suitability for Sandhill Cranes is low; more data collection is needed to confirm this.

Raptor use at the Winner Alternative was observed around 0.25 birds per plot per survey. Raptor use at different sites around the United States has been observed between 1.65 and 0.1 birds per plot per survey (WEST 2009b). Although habitats in these wind resource areas are not necessarily the same as those at the Winner Alternative, they provide the best available comparison for raptor use. Based on this analysis, raptor use is relatively low.

Nesting habitat in the Winner Alternative is limited for above ground nesting raptor species and includes scattered trees, tree rows and shelterbelts. No cliffs or rock outcrops were identified during field studies. Ground-nesting raptors likely nest in areas of continuous grassland habitats within the Winner Alternative. Field studies did not reveal raptor nests within the area (WEST 2009b; Tierra EC 2009); although, it is likely that raptors nest here.

3.4.5 SPECIAL STATUS SPECIES

A list of Federally endangered, threatened, proposed and candidate species by county was obtained from the USFWS (USFWS 2009a) for the Crow Lake and Winner alternatives. Lists for State-listed threatened and endangered species, species of greatest conservation need and species of concern were obtained from the SDGFP (SDGFP 2009c). SDGFP identifies 23 species of fish, reptiles, mammals and birds that warrant special protection.

3.4.5.1 Crow Lake Alternative

Table 3.4-7 identifies the Federal and State-listed species that may occur in Aurora, Brule and Jerauld counties, summarizes the habitat associations, lists the status of these species and lists the likelihood of occurrence in the Crow Lake Alternative.

Table 3.4-7 Federal and State-listed Species that May Occur within the Crow Lake Alternative

Common Name	Scientific Name	Habitat Association	Status[1]	Potential for Occurrence
Whooping Crane	*Grus americana*	Aquatic/wetland/cropland	E, SE	May occur
Topeka shiner	*Notropis topeka*	Small streams with moderate to high water quality; pool substrate gravel, rubble or sand.	E	None – may occur downstream
Piping Plover	*Charadrius melodus*	Shorelines along small alkaline lakes, large reservoirs or river islands with wide beach.	T, ST	May occur as migrant, but unlikely
Bald Eagle	*Haliaeetus leucocephalus*	Aquatic/wetland	BCC, ST	May occur

[1]T = USFWS Threatened, E = USFWS Endangered, BCC = USFWS Bird of Conservation Concern, ST = State Threatened, SE = State Endangered

<u>Federally-listed Species</u>

A BA addressing potential impacts to Federally-listed species is being prepared. More detailed information (*i.e.*, legal status, species ecology, local distribution) from the BA will be presented in the FEIS. The following summarizes the available information.

Whooping Crane

The Whooping Crane was listed as threatened in 1967 (32 FR 4001) and reclassified as endangered in 1970 (35 FR 8495). Critical habitat was designated in Colorado, Idaho, Kansas, Nebraska, New Mexico, Oklahoma and Texas. A species recovery plan was completed in 2005 and revised in 2007 (Canadian Wildlife Service and USFWS 2007).

The Whooping Crane occurs at three locations in the wild and at nine captive sites (Canadian Wildlife Service and USFWS 2007). The only self-sustaining wild population is the Aransas-Wood Buffalo National Park population, which migrates between summer nesting grounds in Wood Buffalo National Park in Canada and winter habitat in the coastal marshes of Aransas National Wildlife Refuge in Texas. Spring migration begins in late-March to early-April and is completed within two to four weeks (Austin and Richert 2001). In the fall, the Aransas-Wood Buffalo National Park population conducts the return 2,600-mile migration. This migration route approximately follows the Missouri River corridor through the midwestern United States. The corridor is approximately 200 miles wide. While Whooping Cranes use a variety of habitats during migration, they primarily roost in shallow, seasonally and semi-permanently flooded, palustrine wetlands, and forage in sub-irrigated wet meadows and cultivated agricultural lands (Lewis 1995; Austin and Richert 2001; Stehn 2007). Most wetlands used for roosting are small (less than 10 acres) and located within 0.5 miles of a suitable feeding site.

Stopover occurrence during migration is common throughout South Dakota; there were 214 observations of Whooping Cranes in South Dakota between 1943 and 2007. The majority of sightings were in the central portion of the State along the Missouri River corridor (Austin and Richert 2001). Whooping Cranes have not been observed in Jerauld County, although they have been sighted in Brule and Aurora counties.

The Crow Lake Alternative is within the 75 and 80 percentile bands of the approximate 200-mile migration corridor. No Whooping Cranes were observed during the avian use surveys conducted in the Crow Lake Alternative (WEST 2009a). The Crow Lake Alternative contains numerous small wetlands, prairie pothole lakes, mixed grasses and cultivated fields. Crow Lake is the largest body of water in the project vicinity. Nielson North is the closest WPA, and emergent and submergent wetland vegetation is present in the lake at the Nielson North WPA. Wetland habitat represents one percent of the Crow Lake Alternative, some of which is Whooping Crane roosting habitat. The area also contains 33 percent cropland and is dominated by grasslands, both of which could be used as foraging habitat. Although the site is located near the edge of the migration corridor, previous sightings in Aurora and Brule counties suggest that Whooping Cranes may occasionally fly over the area during seasonal migrations. Historical occurrence, location of the site within the migration corridor, and the presence of suitable foraging, roosting and stopover habitat indicate that Whooping Cranes may occur in the Crow Lake Alternative (Stehn 2007).

Piping Plover

The Piping Plover was listed as threatened on December 11, 1985 (50 FR 50726-50734) in its entire range except for the Great Lakes watershed, where it was listed as endangered. The final rule designating critical habitat for the wintering population of the Piping Plover was published in the *Federal Register* on July 10, 2001 (50 CFR 17 36038-36143).

The breeding range of the Northern Great Plains population of the Piping Plover includes wetlands in southeastern Alberta and the midwestern United States, including South Dakota. The

Piping Plover winters primarily on the Gulf of Mexico coast. Critical breeding habitat has been designated in areas of South Dakota.

The Piping Plover is known to nest from mid-April to mid-August on sparsely vegetated sandbars in rivers and on sand piles resulting from sand and gravel mining operations. They are also known to use inland alkali wetlands.

According to the USGS Breeding Birds of South Dakota Database, there have been no documented occurrences of the Piping Plover in Jerauld, Brule and Aurora counties (including the Crow Lake Alternative) to date.

Since Piping Plovers primarily occur along river corridors, they are unlikely to occur in the upland portions of the Crow Lake Alternative. Piping Plovers may migrate through the area during spring and fall migration. However, due to the absence of rivers and reservoirs within or near the Proposed Project, they would be infrequent visitors to the area, mostly in spring and fall.

Topeka Shiner

This species was listed by USFWS in December 1998. Critical habitat was designated on July 27, 2004. There is no designated critical habitat in South Dakota (Shearer 2003).

The Topeka shiner is a small pool dwelling minnow that is found in prairie streams of the lower Missouri River Basin and upper Mississippi River Basin. The range of this fish covers eastern South Dakota, southwest Minnesota, eastern Nebraska, Iowa, northern Kansas and Missouri. In South Dakota, the Topeka shiner has been found in about 40 streams in the James River, Big Sioux River and Vermillion River watersheds. The Topeka shiner currently retains its historic distribution and is locally abundant in South Dakota; however, population trends are unclear.

According to the SDDOT website, the species was observed in the Firesteel Creek and the West Branch Firesteel Creek, approximately 25 miles downstream of the Crow Lake Alternative, as recently as 2006 (SDDOT 2006). The eastern portion of the site (within Aurora County) supports the headwaters of three small tributaries to West Branch Firesteel Creek. Shearer (2003) lists BMPs for crossing streams inhabited by the Topeka shiner.

<u>State-Listed Species</u>

Whooping Crane (State Endangered)

The legal status, species ecology and local distribution of Whooping Cranes are discussed above.

Bald Eagle (State Threatened)

In 1978, the Bald Eagle was designated as a Federally-endangered species throughout most of the lower 48 states (43 FR 6233). The species was subsequently downlisted to threatened and in August 2007, the Bald Eagle was de-listed (USFWS 2007). The Bald Eagle remains protected under the Federal BGEPA and MBTA. The Bald Eagle is also listed as threatened by SDGFP (2007).

Bald Eagle habitat consists of large trees in proximity to water bodies that support fish populations (Groves *et al.* 1997). While fish represent the primary food source, Bald Eagles in the western United States also scavenge for carrion on big game winter range. Principal food items for Bald Eagles in South Dakota include fish, waterfowl, jackrabbits and carrion (Groves *et al.* 1997). Bald Eagles typically nest in tall trees or on cliffs within 0.5 mile of a permanent water body.

In South Dakota, Bald Eagles nest along the Missouri River in the central part of the State and along the James River in the southeast portion of the State. Bald Eagles winter near fish runs, waterfowl concentrations and open water. Impoundments along the Missouri River in South Dakota often support wintering and migrating Bald Eagles. Bald Eagles are generally present in this area between November and March. While there are no known nests or roost sites within the Crow Lake Alternative, the Bald Eagle may occur as a transient within the area during winter months.

<u>State and Federal Species of Concern</u>

Certain species are not protected as threatened, endangered or candidate species, but are identified as species of concern in the *South Dakota Comprehensive Wildlife Conservation Plan* (SDGFP 2006). The plan identifies wildlife species meeting three criteria of conservation concern: 1) Federal or State threatened or endangered listing; 2) South Dakota represents the majority of a species range; and 3) the species depends on a declining or unique habitat in South Dakota. Species in the Eastern Prairie Ecoregion, Mixedgrass Subregion that may occur in the Crow Lake Alternative are listed in **Table 3.4-8**. In addition to those species, South Dakota maintains a list of Level 1 priority bird species (**Table 3.4-8**). Level 1 priority bird species are those with the highest conservation priority due to: 1) high maximum abundance of the species within its range; 2) South Dakota constitutes the core of the species breeding range; and 3) the species is showing population declines in South Dakota or across its range (Bakker 2005). Some Level 1 birds are also species of concern.

The USFWS has also identified species, subspecies and populations of migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the ESA. Birds of Conservation Concern (BCC) (2008) is the most recent effort to carry out this mandate.

Greater Prairie Chicken

Greater Prairie Chicken populations continue to decline, especially in grassland habitat. Greater Prairie Chickens are year-round residents of central South Dakota. Breeding occurs throughout the State; however, Greater Prairie Chicken breeding has not been documented in Jerauld County (Huxoll 2005). Greater Prairie Chickens were observed in the Crow Lake Alternative during 2009 aerial grouse lek surveys (WEST 2009a, Tierra EC 2009). Five grouse leks were found; one was confirmed as Greater Prairie Chicken. Three of the leks could not be identified to species (WEST 2009a).

Table 3.4-8 South Dakota Species of Concern, Level 1 Bird Species and Birds of Conservation Concern Occurring in the Crow Lake Alternative

Common Name	Scientific Name	Ecosystem	Global Rank	State Rank	BCC	Occurrence
Birds						
Greater Prairie Chicken	*Tympanuchus cupido*	Grass/shrub	G4	S4	No	Occurs
Sharp-tailed Grouse	*Tympanuchus phasianellus*	Grass/shrub	G4	S4	No	Occurs
LeConte's Sparrow	*Ammodramus leconteii*	Riparian/wetland	G4	S1	No	May occur[1]
Chestnut-collared Longspur	*Calcarius ornatus*	Grass/shrub	G5	S4	Yes	May occur[1]
American Bittern	*Botaurus lentiginosus*	Riparian/wetland	G4	S4	No	May occur
Northern Harrier	*Circus cyaneus*	Grassland	G5	S5	No	Occurs
Ferruginous Hawk	*Buteo regalis*	Grassland	G4	S4	No	May occur
Swainson's Hawk	*Buteo swainsoni*	Grassland/woodland	G5	S4	Yes	Occurs
Upland Sandpiper	*Bartramia longicauda*	Grassland	G5	S5	Yes	Occurs
Marbled Godwit	*Limosa fedoa*	Riparian/wetland/grassland	G5	S5	Yes	Occurs
Wilson's Phalarope	*Phalaropus tricolor*	Riparian/wetland/grassland	G5	S4	No	May occur
Black-crowned Night Heron	*Nycticorax nycticorax*	Wetland	G5	S3	No	Occurs
Long-billed Curlew	*Numenius americanus*	Grassland	G5	S3	No	May occur
Grasshopper Sparrow	*Ammodramus savannarum*	Grassland	G5	S4	Yes	Occurs
Western Meadowlark	*Sturnella neglecta*	Grassland	G5	S5	No	Occurs
Lark Bunting	*Calamospiza melanocorys*	Grassland	G5	S5	No	May occur
Burrowing Owl	*Athene cunicularia*	Grassland	G4	S3/S4	No	May occur
Black Tern	*Chlidonias niger*	Wetland/open water	G4	S3	No	Occurs[2]
Prairie Falcon	*Falco mexicanus*	Grassland	G5	S3/S4	Yes	Occurs
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Open woodland	G5	S3	Yes	Occurs
McCown's Longspur	*Calcarius mccownii*	Grassland	G5	SU/SZ	Yes	Occurs
Dickcissel	*Spiza americana*	Grassland	G5	S2	Yes	Occurs
Loggerhead Shrike	*Lanius ludovicianus*	Grassland/woodland	G4	S4	Yes	Occurs
Invertebrates						
Regal fritillary	*Speyeria idalia*	Grass/shrub	G3	S3	N/A	May occur

[1]Migratory occurrence is likely

[2]Known to occur at Crow Lake one mile north of the Crow Lake Alternative (SDNHP 2009)

KEY TO CODES USED IN GLOBAL AND STATE RANKS:

G1 S1 Critically imperiled because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 S2 Imperiled because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 S3 Either very rare and local throughout its range, or found locally (even abundantly at some of its locations) in a restricted range, or vulnerable to extinction throughout its range because of other factors; in the range of 21 of 100 occurrences.

G4 S4 Apparently secure, though it may be quite rare in parts of its range, especially at the periphery. Cause for long term concern.

G5 S5 Demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery.

SZ No definable occurrences for conservation purposes, usually assigned to migrants.

Bird species may have two State ranks, one for breeding (S#B) and one for nonbreeding seasons (S#N)

BCC – USFWS Birds of Conservation Concern

Sharp-tailed Grouse

Sharp-tailed Grouse populations continue to decline, especially in grassland habitat. Sharp-tailed Grouse are year-round residents in the western portion of South Dakota. Breeding occurs throughout the State distribution and has been documented in northwestern Jerauld County (Huxoll 2005). Sharp-tailed Grouse were observed in the Crow Lake Alternative during 2009 aerial grouse lek surveys (WEST 2009a). Five grouse leks were found; one was confirmed Sharp-tailed Grouse.

Le Conte's Sparrow

Le Conte's Sparrows may be common within its range where suitable habitat is present. Le Conte's Sparrows are migratory residents in central South Dakota and summer residents in the northeastern portion of the State. Breeding has not been documented in Aurora, Brule or Jerauld counties (South Dakota Birds 2009). Le Conte's Sparrows were not observed in the Crow Lake Alternative during 2009 avian use surveys (WEST 2009a).

Chestnut-collared Longspur

Chestnut-collared Longspurs are common within their range where suitable habitat is present. Declining populations are generally local. Chestnut-collared Longspurs are summer residents in South Dakota. Breeding has been documented in northwest Jerauld County (South Dakota Birds 2009). Chestnut-collared Longspurs were observed in the Crow Lake Alternative during 2009 breeding bird surveys (WEST 2009a).

American Bittern

American Bittern populations continue to decline in wetland habitat, especially in the southern portion of its range. American bitterns are summer residents in South Dakota. Breeding has not been documented in Aurora, Brule or Jerauld counties, but has been documented in northeastern South Dakota (South Dakota Birds 2009). American Bitterns were not observed in the Crow Lake Alternative during 2009 breeding bird surveys (WEST 2009a).

Northern Harrier

Northern Harrier populations continue to decline primarily due to loss of wetland habitat and pesticide use within its range. Northern Harriers are summer residents of South Dakota and breed throughout the State. Breeding has not been documented in Aurora, Brule or Jerauld counties although it is probable (South Dakota Birds 2009). Northern Harriers were observed in the Crow Lake Alternative during spring 2009 migratory and breeding bird surveys (WEST 2009a).

Ferruginous Hawk

Ferruginous Hawks are summer residents of South Dakota and breed throughout much of the State. They occur in the northern half of the Eastern Prairie Ecoregion (the northern portion of the Crow Lake Alternative). However, breeding has not been documented in Aurora, Brule or

Jerauld counties (South Dakota Birds 2009). Ferruginous Hawks were not observed in the area during spring 2009 migratory and breeding bird surveys (WEST 2009a).

Swainson's Hawk

Swainson's Hawks are summer residents of South Dakota and breed throughout much of the State. Breeding has been documented in Brule and Aurora counties (South Dakota Birds 2009). Swainson's Hawks were observed in the Crow Lake Alternative during spring 2009 migratory bird surveys (WEST 2009a).

Upland Sandpiper

Upland Sandpiper populations continue to decline primarily due to loss of wetland habitat and pesticide use. Upland Sandpipers are summer residents of South Dakota and breed throughout the State. However, breeding has not been documented in Aurora, Brule or Jerauld counties, although it is probable (South Dakota Birds 2009). Upland Sandpipers were observed in the Crow Lake Alternative during 2009 migratory and breeding bird surveys (WEST 2009a).

Marbled Godwit

Marbled Godwit populations continue to decline from historic levels primarily due to loss of wetland habitat within its range. Marbled Godwits are summer residents of South Dakota and breed throughout the State. Breeding has not been documented in Aurora, Brule or Jerauld counties (South Dakota Birds 2009). Marbled Godwits were observed in the Crow Lake Alternative during 2009 migratory and breeding bird surveys (WEST 2009a).

Wilson's Phalarope

Wilson's Phalarope populations continue to decline in local portions of its range due to loss of wetland habitat. Wilson's Phalaropes are summer residents of South Dakota and breed throughout the State. Breeding has not been documented in Aurora, Brule or Jerauld counties (South Dakota Birds 2009). Wilson's Phalarope was not observed in the Crow Lake Alternative during 2009 avian use surveys (WEST 2009a).

Black-crowned Night Heron

Black-crowned Night Heron threats include wetland loss and degradation, and pesticides that result in indirect adult mortality and direct mortality of eggs and young. Black-crowned Night Herons are summer residents of South Dakota and breed throughout the eastern part of the State. Breeding has been observed in Aurora and Jerauld counties (South Dakota Birds 2009). Black-crowned Night Herons were observed in the Crow Lake Alternative during spring 2009 migratory bird surveys (WEST 2009a).

Long-billed Curlew

Long-billed Curlew threats include habitat loss, degradation and alteration, nest site disturbance, and pesticide/herbicide impacts (SDGFP 2006). Long-billed Curlews are summer residents of South Dakota and breed throughout the western part of the State. Breeding has not been observed east of the Missouri River or in Aurora, Brule and Jerauld counties (South Dakota Birds 2009). Long-billed Curlews were not observed in the Crow Lake Alternative during spring 2009 migratory bird surveys (WEST 2009a).

Grasshopper Sparrow

Grasshopper Sparrow populations continue to decline in local portions of its range due to loss of grassland habitat. Grasshopper Sparrows are summer residents of South Dakota and breed throughout the State. Breeding has not been documented in Aurora, Brule or Jerauld counties, although it is probable (South Dakota Birds 2009). Grasshopper Sparrows were observed in the Crow Lake Alternative during 2009 breeding bird surveys (WEST 2009a).

Western Meadowlark

Western Meadowlark populations are secure, and considered abundant and widespread. Local populations are monitored due to declines in grassland habitat. Western Meadowlarks are summer residents of South Dakota and breed throughout the State. Breeding has not been documented in Jerauld County but has been documented in Aurora and Brule counties (South Dakota Birds 2009). Western Meadowlarks were observed in the Crow Lake Alternative during 2009 breeding and migratory bird surveys (WEST 2009a).

Lark Bunting

Lark Bunting populations are secure, and considered abundant and widespread. Local populations are monitored due to declines in grassland habitat in South Dakota. Lark Buntings are summer residents throughout South Dakota and breed throughout the State. Breeding has not been documented in Aurora, Brule or Jerauld counties, although it is probable (South Dakota Birds 2009). Lark Buntings were not observed in the Crow Lake Alternative during 2009 breeding and migratory bird surveys (WEST 2009a).

Burrowing Owl

Burrowing Owl threats include habitat loss, degradation and alteration, nest depredation, vehicle collisions and illegal shooting (SDGFP 2006). Burrowing Owls are summer residents throughout South Dakota and mostly breed in the western two-thirds of the State. Breeding has not been documented in Aurora, Brule or Jerauld counties, although it is probable in Brule County (South Dakota Birds 2009). Burrowing Owls were not observed in the Crow Lake Alternative during 2009 breeding and migratory bird surveys (WEST 2009a); however, two prairie dog towns were observed along the northwest Crow Lake Alternative boundary. Burrowing Owls have been shown to prefer active prairie dog towns; it has been suggested that large colonies are needed to maintain Burrowing Owl populations.

Black Tern

Black Terns are summer residents throughout South Dakota and breed throughout the State. Breeding has been documented in Aurora County and is probable in Jerauld County (South Dakota Birds 2009). According to the SDNHP database (2009) and the NRCS (1999), Black Terns occur at Crow Lake approximately one mile north of the Crow Lake Alternative (**Figure 3.4-2**). Black Terns were not observed in the area during 2009 breeding and migratory bird surveys (WEST 2009a).

Prairie Falcon

Prairie Falcons are permanent residents throughout South Dakota; however, some move short distances to the south for the winter. They are known to breed in the western portion of the State; breeding has not been documented in Aurora, Brule or Jerauld counties (South Dakota Birds 2009). Prairie Falcons were observed in the area during 2009 breeding and migratory bird surveys (WEST 2009a).

Red-headed Woodpecker

Red-headed Woodpeckers are permanent residents throughout South Dakota. They are known to breed statewide. Breeding has been documented in Jerauld County, is possible in Aurora County, and is probable in Brule County (South Dakota Birds 2009). Red-headed Woodpeckers were observed in the area during 2009 breeding and migratory bird surveys (WEST 2009a).

McCown's Longspur

McCown's Longspurs are summer residents throughout South Dakota. South Dakota is on the eastern edge of their major breeding grounds (Bakker 2005), and they are rare breeders in western South Dakota (South Dakota Birds 2009). Breeding is not likely in Aurora, Brule or Jerauld counties. McCown's Longspurs were observed in the area during 2009 breeding and migratory bird surveys (WEST 2009a).

Dickcissel

Dickcissels are summer residents throughout South Dakota. Dickcissels preferred large grasslands in the mixed grass region of eastern South Dakota (Bakker 2005). Breeding is confirmed in Aurora and Brule counties, and is possible in Jerauld County (South Dakota Birds 2009). Dickcissels were observed in the area during 2009 breeding and migratory bird surveys (WEST 2009a).

Loggerhead shrike

Loggerhead Shrikes are summer residents throughout South Dakota. They breed statewide. Breeding is confirmed in Aurora County, and is possible in Brule and Jerauld counties (South Dakota Birds 2009). Loggerhead Shrikes were observed in the area during 2009 breeding and migratory bird surveys (WEST 2009a).

Regal Fritillary Butterfly

The regal fritillary butterfly is vulnerable, at moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer) and recent widespread declines. Regal fritillaries are distributed throughout the State and have been documented in all counties except three (Buffalo, Aurora and Miner). Regal fritillaries continue to do well in areas in and around Fort Pierre National Grassland in central South Dakota. Regal fritillaries were last documented in Jerauld County in 1992 (SDNHP 2007). The presence of regal fritillary butterflies in the Crow Lake Alternative is unknown.

3.4.5.2 Winner Alternative

Table 3.4-9 identifies the Federal and State-listed species that may occur in Tripp County, summarizes the habitat associations, lists the status of these species and lists the likelihood of occurrence in the Winner Alternative.

Federally-listed Species

Whooping Crane

Whooping Crane legal status and species ecology was discussed in **Section 3.4.5.1, Federally-listed Species, *Whooping Crane*.** Whooping Cranes have been observed in Tripp County near the Winner Alternative.

Table 3.4-9 Federal and State-listed Species that May Occur within the Winner Alternative

Common Name	Scientific Name	Habitat Association	Status[1]	Potential for Occurrence
Whooping Crane	*Grus americana*	Aquatic/wetland/cropland	E, SE	May occur
American burying beetle	*Nicrophorus americanus*	Large landscapes with abundant carrion and sandy soils	E	Occurs
Blacknose shiner	*Notropis heterolepis*	Aquatic	SE	None – occurs downstream in Keya Paha River
Northern redbelly dace	*Phoxinus eos*	Aquatic	ST	Occurs in Keya Paha Watershed*
Pearl dace	*Margariscus margarita*	Aquatic	ST	Occurs in Keya Paha Watershed*

[1]T = USFWS Threatened, E = USFWS Endangered, XN= Proposed/Experimental Population, ST = State Threatened, SE = State Endangered
*SDNHP data shows known occurrence in or very near the Winner Alternative.

The Winner Alternative is within the 75 percentile sighting band in the 200-mile migration corridor. No Whooping Cranes were observed during the avian use surveys conducted in the Winner Alternative in 2009 (WEST 2009b). The Winner Alternative contains numerous small wetlands, small lakes, mixed grasses and cultivated fields. Dog Ear Lake is the largest body of water in the project vicinity and is within 0.25 mile of the Winner Alternative. Little Dog Ear Lake is smaller, and is within the Winner Alternative. Emergent and submergent wetland vegetation is present in both lakes. There are no WPAs within or near the Winner Alternative. Wetland habitat represents slightly over one percent of the Winner Alternative, some of which is Whooping Crane roosting habitat. The Winner Alternative also contains cropland and is dominated by grasslands, both of which could be used as foraging habitat. Previous sightings in Tripp County suggest that Whooping Cranes may occasionally fly over the Winner Alternative during seasonal migrations. Historical occurrence, location of the Winner Alternative within the 200-mile migration corridor, and the presence of suitable foraging, roosting and stopover habitat indicate that Whooping Cranes may occur in the Winner Alternative (Stehn 2007).

American Burying Beetle

The American burying beetle was listed as an endangered species in 1989 (FR 54:29652-29655). A recovery plan was published in 1991 (USFWS 1991). No critical habitat has been designated for this species.

Considering the broad geographic range formerly occupied by the American burying beetle, it is unlikely that vegetation or soil type were historically limiting. Today, the American burying beetle seems to be largely restricted to areas most undisturbed by human influence.

Carrion availability (appropriate in size as well as numbers) may be more important in determining where beetles occur than the type of vegetation or soil structure. Habitats in Nebraska where these beetles have been recently found consist of grassland prairie, forest edge and scrubland. Specific habitat requirements are unknown.

Adults become active in early summer. These carrion beetles lay their eggs in the carcasses of small animals. The larvae receive parental care while feeding and growing. This is an extremely rare behavior in insects, a condition normally found only in social bees, wasps, ants and termites. The adults continually tend the carcass, removing fungi and covering the carrion ball with an antibacterial secretion. After about a week, the larvae have consumed all but the bones of the carcass, and the adults fly away. Adults live only one season. The young pupate in the nearby soil and emerge as adults about a month later. Beetles overwinter in the adult stage.

Burial of the food resource, which effectively removes it from intense competition by maggots, other carrion-feeding insects and even mammal scavengers, is of principal importance to the beetles and their young (USFWS 2009b).

Populations of American burying beetles have been extirpated from 90 percent of their original range. Known populations occur in South Dakota, Arkansas, Nebraska, Oklahoma and Rhode Island. A few collections have also been made in Kansas. There are perhaps fewer than 1,000 individuals in the only remaining population east of the Mississippi River, and the Oklahoma, Arkansas and South Dakota populations (currently being inventoried) are of uncertain size. South Dakota estimates over 500 square miles of occupied habitat with a high population density. American burying beetles have been documented in South Dakota in numerous locations in Tripp County between 1995 and 2003, including in the Winner Alternative (SDGFP 2009e).

State-Listed Species

Whooping Crane

The legal status and species ecology of Whooping Cranes are discussed in **Section 3.4.5.1, Federally-listed Species, *Whooping Crane***. The local distribution of Whooping Cranes is discussed above**.**

Blacknose Shiner

Blacknose shiner is listed by the State as endangered. The species is an important indicator of high water quality and pristine streams. It is known to occur in southern Tripp County in the Keya Paha watershed (SDGFP 2006).

Northern Redbelly Dace

Northern redbelly dace is listed by the State as threatened. This species is widespread in the northern United States and Canada in boggy lakes, creeks and ponds. It is often found in tea-colored, slightly acidic water. It is found in the Big Sioux, Minnesota, Niobrara and Crow Creek drainages in South Dakota. Northern redbelly dace are known to occur in the Keya Paha watershed within one mile of the Winner Alternative (SDNHP 2009).

Pearl Dace

Pearl dace is listed by the State as threatened. It occurs in southern Tripp County in the Keya Paha watershed (SDGFP 2006) and has been documented within one mile of the Winner Alternative (SDNHP 2009).

State and Federal Species of Concern

State species of concern that may occur in the Winner Alternative are listed in **Table 3.4-10**. In addition to those species, South Dakota maintains a list of Level 1 priority bird species, and the USFWS maintains the BCC list (**Table 3.4-10**).

Table 3.4-10 South Dakota Species of Concern, Level 1 Bird Species and Birds of Conservation Concern Occurring in the Winner Alternative

Common Name	Scientific Name	Ecosystem	Global Rank	State Rank	BCC	Occurrence
Birds						
Greater Prairie Chicken	*Tympanuchus cupido*	Grass/shrub	G4	S4	No	Occurs
Sharp-tailed Grouse	*Tympanuchus phasianellus*	Grass/shrub	G4	S4	No	Occurs
Chestnut-collared Longspur	*Calcarius ornatus*	Grass/shrub	G5	S4	Yes	Occurs
American Bittern	*Botaurus lentiginosus*	Riparian/wetland	G4	S4	No	May occur
Northern Harrier	*Circus cyaneus*	Grassland	G5	S5	No	Occurs
Ferruginous Hawk	*Buteo regalis*	Grassland	G4	S4	Yes	Occurs
Swainson's Hawk	*Buteo swainsoni*	Grassland/woodland	G5	S4	No	Occurs
Upland Sandpiper	*Bartramia longicauda*	Grassland	G5	S5	Yes	Occurs
Marbled Godwit	*Limosa fedoa*	Riparian/wetland/ grassland	G5	S5	Yes	Occurs
Wilson's Phalarope	*Phalaropus tricolor*	Riparian/wetland/ grassland	G5	S4	No	Occurs
Long-billed Curlew	*Numenius americanus*	Grassland	G5	S3	No	Occurs*
Grasshopper Sparrow	*Ammodramus savannarum*	Grassland	G5	S4	Yes	Occurs
Western Meadowlark	*Sturnella neglecta*	Grassland	G5	S5	No	Occurs
Lark Bunting	*Calamospiza melanocorys*	Grassland	G5	S5	No	May occur
Orchard Oriole	*Icterus spurious*	Grassland/woodland			No	Occurs
Burrowing Owl	*Athene cunicularia*	Grassland	G4	S3/S4	Yes	Occurs
Black Tern	*Chlidonias niger*	Wetland/open water	G4	S3B/ SZN	No	May occur
Trumpeter Swan	*Cygnus buccinator*	Aquatic/wetland	G4	S3	No	May occur*
American White Pelican	*Pelecanus erythrorhynchos*	Aquatic	G3	S3B/ SZN	No	Occurs*
Prairie Falcon	*Falco mexicanus*	Grassland	G5	S3/S4	Yes	Occurs
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Open Woodland	G5	S3	Yes	Occurs
Loggerhead Shrike	*Lanius ludovicianus*	Grassland/woodland	G4	S4	Yes	Occurs
Dickcissel	*Spiza americana*	Grassland	G5	S2	Yes	Occurs
Mammals						
Plains spotted skunk	*Spilogale putorius interrupta*	Grassland	G5	S3	N/A	Occurs*
Fish						
Plains topminnow	*Fundulus sciadicus*	Aquatic	G4	S3	N/A	Occurs*

Table 3.4-10 South Dakota Species of Concern, Level 1 Bird Species and Birds of Conservation Concern Occurring in the Winner Alternative

Common Name	Scientific Name	Ecosystem	Global Rank	State Rank	BCC	Occurrence
Invertebrates						
Regal fritillary	*Speyeria idalia*	Grass/shrub	G3	S3	N/A	May occur*
Amphibians						
Plains leopard frog	*Rana blairi*	Aquatic/wetland/ grassland	G5	S3/S4	N/A	Occurs*
Reptiles						
Lesser earless lizard	*Holbrookia maculata*	Riparian/grassland	G5	S2	N/A	Occurs*
Western box turtle	*Terrapene ornate*	Aquatic	G5	S2	N/A	May occur*

*SDNHP data shows known occurrence in or very near the Winner Alternative (SDNHP 2009).
KEY TO CODES USED IN GLOBAL AND STATE RANKS:
G1 S1 Critically imperiled because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.
G2 S2 Imperiled because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.
G3 S3 Either very rare and local throughout its range, or found locally (even abundantly at some of its locations) in a restricted range, or vulnerable to extinction throughout its range because of other factors; in the range of 21 of 100 occurrences.
G4 S4 Apparently secure, though it may be quite rare in parts of its range, especially at the periphery. Cause for long term concern.
G5 S5 Demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery.
SZ No definable occurrences for conservation purposes, usually assigned to migrants
Bird species may have two state ranks, one for breeding (S#B) and one for nonbreeding seasons (S#N)
BCC – USFWS Birds of Conservation Concern

Greater Prairie Chicken

The legal status and species ecology of Greater Prairie Chicken are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Greater Prairie Chicken***.

Breeding has been documented in Tripp County (Huxoll 2005). Greater Prairie Chickens were observed in the Winner Alternative during spring and summer surveys as well as in 2009 aerial grouse lek surveys (WEST 2009b, Tierra EC 2009). Eight grouse leks were confirmed in the Winner Alternative during the surveys. Two of the leks were confirmed Greater Prairie Chicken. The remaining six could not be identified to species (WEST 2009b); however, three of the leks had Greater Prairie Chicken flying over and are likely associated with this species. Eight additional areas (six in the Winner Alternative and two adjacent to the Winner Alternative) likely support leks based on the presence of large or multiple groups of grouse, but leks were not confirmed.

Sharp-tailed Grouse

The legal status and species ecology of Sharp-tailed Grouse are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Sharp-tailed Grouse***. Breeding has been documented in Tripp County (Huxoll 2005). Sharp-tailed Grouse were observed in the Winner Alternative during 2009 aerial grouse lek surveys (WEST 2009b). Eight grouse leks were confirmed in the Winner Alternative during the surveys. Six could not be identified to species (WEST 2009b); however, it is likely that some of them were Sharp-tailed Grouse. Eight additional areas (six in the Winner Alternative and two adjacent to the Winner Alternative) likely support leks based on the presence of large or multiple groups of grouse, but leks were not confirmed. Three of these had Sharp-tailed Grouse.

Chestnut-collared Longspur

The legal status and species ecology of Chestnut-collared Longspur are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Chestnut-collared Longspur***. Chestnut-collared Longspur breeding has been documented in southern Tripp County (South Dakota Birds 2009). Chestnut-collared Longspurs were observed in the Winner Alternative during 2009 breeding bird surveys (WEST 2009b).

American Bittern

The legal status and species ecology of American Bittern are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *American Bittern***. Breeding has not been documented in Tripp County, but it is possible (South Dakota Birds 2009). American Bitterns were not observed in the Winner Alternative during 2009 breeding bird surveys (WEST 2009b).

Northern Harrier

The legal status and species ecology of Northern Harrier are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Northern Harrier***. Breeding has not been documented in Tripp County although it is possible (South Dakota Birds 2009). Northern Harriers were observed in the Winner Alternative during spring 2009 migratory bird surveys (WEST 2009b).

Ferruginous Hawk

The legal status and species ecology of Ferruginous Hawk are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Ferruginous Hawk***. Breeding has not been documented in Tripp County, although it is probable (South Dakota Birds 2009). Ferruginous Hawks were observed in the Winner Alternative during spring 2009 avian use surveys (WEST 2009b).

Swainson's Hawk

The legal status and species ecology of Swainson's Hawk are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Swainson's Hawk***. Breeding has been documented in Tripp County, although it is probable (South Dakota Birds 2009). Swainson's Hawks were observed in the Winner Alternative during spring 2009 migratory bird surveys (WEST 2009b).

Upland Sandpiper

The legal status and species ecology of Upland Sandpiper are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Upland Sandpiper***. Breeding has not been documented in Tripp County, although it is probable (South Dakota Birds 2009). Upland Sandpipers were observed in the Winner Alternative during 2009 migratory and breeding bird surveys (WEST 2009b).

Marbled Godwit

The legal status and species ecology of Marbled Godwit are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Marbled Godwit***. Breeding has not been documented in Tripp County (South Dakota Birds 2009). Marbled Godwits were observed in the Winner Alternative during 2009 migratory bird surveys (WEST 2009b).

Wilson's Phalarope

The legal status and species ecology of Wilson’s Phalarope are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Wilson’s Phalarope***. Breeding has not been documented in Tripp County, although it is probable (South Dakota Birds 2009). Wilson's Phalarope was observed in the Winner Alternative during 2009 breeding bird surveys (WEST 2009b).

Long-billed Curlew

The legal status and species ecology of Long-billed Curlew are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Long-billed Curlew***. Breeding has been confirmed in southern Tripp County (South Dakota Birds 2009). Long-billed Curlews were not observed in the Winner Alternative during spring 2009 avian use surveys (WEST 2009b).

Grasshopper Sparrow

The legal status and species ecology of Grasshopper Sparrow are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Grasshopper Sparrow***. Breeding has not been documented in Tripp County, although it is possible (South Dakota Birds 2009). Grasshopper Sparrows were observed in the Winner Alternative during 2009 breeding bird surveys (WEST 2009b).

Western Meadowlark

The legal status and species ecology of Western Meadowlark are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Western Meadowlark***. Breeding has been documented in Tripp County (South Dakota Birds 2009). Western Meadowlarks were observed in the Winner Alternative during 2009 breeding and migratory bird surveys (WEST 2009b).

Lark Bunting

The legal status and species ecology of Lark Bunting are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Lark Bunting***. Breeding has not been documented in Tripp County, although it is probable (South Dakota Birds 2009). Lark Buntings were not observed in the Winner Alternative during 2009 breeding and migratory bird surveys (WEST 2009b).

Orchard Oriole

Orchard Oriole is a common summer resident throughout much of South Dakota. Breeding has not been documented in Tripp, although it is probable (South Dakota Birds 2009). Orchard Orioles were observed in the Winner Alternative during 2009 breeding bird surveys (WEST 2009b).

Burrowing Owl

The legal status and species ecology of Burrowing Owl are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Burrowing Owl***. Breeding has not been documented in Tripp County (South Dakota Birds 2009). Burrowing Owls were observed in the Winner Alternative during 2009 avian use surveys (WEST 2009b). There are two known prairie dog towns in the Winner Alternative that are suitable Burrowing Owl habitat: one in the west portion and one in the southeast portion.

Black Tern

The legal status and species ecology of Black Tern are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Black Tern***. Breeding has been observed in Tripp County (South Dakota Birds 2009). Black Terns were not observed in the Winner Alternative during 2009 breeding and migratory bird surveys (WEST 2009b).

Trumpeter Swan

Trumpeter Swan threats include habitat loss, degradation and alteration resulting in the reduction of shallow areas, reduction in beaver ponds, irregular managed water flows, nest site disturbance, pesticide impacts, lead poisoning and illegal shooting (SDGFP 2006). Trumpeter Swans are summer residents in the western half of South Dakota; very little breeding is known in the State. Breeding has not been confirmed in Tripp County, although it is probable in southern Tripp County (South Dakota Birds 2009). Trumpeter Swans were not observed in the Winner Alternative during 2009 breeding and migratory bird surveys (WEST 2009b); however, they are known to occur at several lakes in and near the Winner Alternative, including Little Dog Ear Lake and Dog Ear Lake (SDNHP 2009).

American White Pelican

American White Pelican threats include habitat loss, degradation and alteration resulting in the reduction of shallow areas, irregular managed water flows, nest site disturbance and pesticide impacts (SDGFP 2009).

American White Pelicans are mostly migratory through South Dakota, although summer residents have been documented in northeastern South Dakota; very little breeding is known in the State (SDGFP 2006). Breeding has been observed but not confirmed in northwestern Tripp County (South Dakota Birds 2009). American White Pelicans were observed in the Winner Alternative during 2009 breeding and migratory bird surveys (WEST 2009b).

Prairie Falcon

The legal status and species ecology of Prairie Falcon are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Prairie Falcon***. Breeding has not been documented in Tripp County (South Dakota Birds 2009). Prairie Falcons were observed in the Winner Alternative during 2009 breeding bird surveys (WEST 2009b).

Red-headed Woodpecker

The legal status and species ecology of Red-headed Woodpecker are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Red-headed Woodpecker***. Breeding has been documented in Tripp County (South Dakota Birds 2009). Red-headed Woodpeckers were observed in the Winner Alternative during 2009 breeding bird surveys (WEST 2009b).

Dickcissel

The legal status and species ecology of Dickcissel are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Dickcissel***. Breeding has been documented in Tripp County (South Dakota Birds 2009). Dickcissels were observed in the Winner Alternative during 2009 breeding bird surveys (WEST 2009b).

Loggerhead Shrike

The legal status and species ecology of Loggerhead Shrike are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Loggerhead Shrike***. Breeding has not been documented in Tripp County but USGS indicates it is possible (South Dakota Birds 2009). Loggerhead Shrikes were observed in the Winner Alternative during 2009 breeding bird surveys (WEST 2009b).

Plains Spotted Skunk

The plains spotted skunk was formerly common but their populations began declining in the mid-1900s. The decrease may be related to the changes in agriculture that stressed clean farming, thereby leaving little cover for skunks. It also is possible that increased pesticide use in agricultural areas has affected insect abundance, which skunks commonly eat.

Plains spotted skunk is known to occur in the northern portion of the Winner Alternative just south of Winner (SDNHP 2009).

Plains Topminnow

The plains topminnow has a limited range, with eastern South Dakota forming the upper, western edge. The plains topminnow is threatened by any activity causing alteration of its habitat, particularly groundwater withdrawal and drainage of wetlands (SDGFP 2009d).

The plains topminnow has a limited range within the Missouri River drainage, from eastern Wyoming to southwestern Minnesota and northwestern Iowa. The plains topminnow occurs in the James, Vermillion and Big Sioux river basins in eastern South Dakota. It is most common in the James River basin where it occurs in several tributaries, as well as backwater pools and ponds. It is present west of the Winner Alternative in the Keya Paha watershed (SDNHP 2009).

Plains Leopard Frog

Plains leopard frogs occur in the vicinity of streams, natural and artificial ponds, reservoirs, creek pools, irrigation ditches and other bodies of water in plains grassland, sand hills, stream valleys and canyon bottoms. Plains leopard frogs may disperse far from water during wet, mild weather. Plains leopard frogs are known to occur in the northern portion of the Winner Alternative, approximately 5 miles south of Winner (SDNHP 2009).

Lesser Earless Lizard

Lesser earless lizard threats include habitat loss or degradation due to stabilization of sand dunes and loss of habitat from land conversion by agriculture and urban development (SDGFP 2006). Lesser earless lizards are known to occur in southern Tripp County, including the Winner Alternative (**Figure 3.4-2**) (SDGFP 2006; SDNHP 2009). This lizard prefers sand hills, sandy or gravelly areas along streams, sparsely vegetated or short grass ecosystems, and prairie dog towns (SDGFP 2006).

Western Box Turtle

Western box turtle threats include habitat loss or degradation due to stream channelization and impoundment, water pollution, removal of basking sites (large woody debris) and lack of nesting sites such as sandbars (SDGFP 2006). Western box turtles occur in southern Tripp County, including the Winner Alternative (**Figure 3.4-4**) (SDGFP 2006; SDNHP 2009).

Regal Fritillary Butterfly

The legal status and species ecology of Regal Fritillary are discussed in **Section 3.4.5.1, State and Federal Species of Concern, *Regal Fritillary Butterfly***. Regal fritillaries are distributed throughout the State and have been documented in all counties except three (Buffalo, Aurora and Miner). The presence of regal fritillary butterflies in the Winner Alternative is unknown, although there is a documented occurrence five miles south of the Winner Alternative (SDNHP 2009).

3.5 CULTURAL RESOURCES

A cultural resource is an all-encompassing term for an archaeological, historical or Native American resource. They are sites, structures, landscapes and objects of some importance to a culture or community for scientific, traditional, religious or other reasons. They are the materials and built features left from past human activities that are studied to reconstruct past human behavior and actions. Native American resources include but are not limited to Traditional Cultural Properties (TCPs). A TCP is a resource that is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community. TCPs are most often associated with Native Americans, but can be associated with any group if they fit the criteria described in the definition of a TCP.

The ROI for cultural resource analysis encompasses locations within the alternatives that would potentially be disturbed by construction and operation of the Proposed Project. Additional prehistoric background information for the Proposed Project alternatives is in **Appendix D**. The Proposed Project must consider impacts to cultural resources under NEPA. Western is the lead Federal agency for Section 106 of the NHPA and its implementing regulations (36 CFR 800), which include the identification, management and treatment of cultural resources, as well as the government-to-government consultation process.

3.5.1 NATIVE AMERICANS OF THE PROPOSED PROJECT AREA, RELIGIOUS CONCERNS

<u>Sioux</u>

The Sioux tribes share a common language, history, social organization and culture (DeMallie 2001a:718). Historically the Sioux were referred to as the Great Sioux Nation. The seven nations that compose the Sioux are Mdewakanton, Wahpeton, Wahpekute, Sisseton, Yankton, Yanktonai and the Teton. The Sioux tribes within the Proposed Project area include the Santee (Eastern Dakota), the Yankton-Yanktonai (Western Dakota) and the Teton (Lakota) **(Figure 3.5-1)**. Linguistic reconstruction places the homeland of the proto-western Siouans west of Lake Michigan; Sioux traditions recount an origin near "the northern lakes east of the Mississippi," and 19th century Santee tradition records that "their fathers left the lakes around the headwaters of the upper Mississippi" and traveled downstream to the Minnesota River region because of the abundance of buffalo there. The archaeological record adds little to the question of Sioux origins because the prehistoric sites in Minnesota are classified as Woodlands tradition, as are the early historic or contact sites (DeMallie 2001a:718-719).

The Santee territory encompassed a transitional ecozone that included both deciduous forest and tall-grass prairie; the Yankton-Yanktonai territory was tall-grass prairie; and the Teton territory was primarily plains. Buffalo was considered the meat staple for the Santee, Yankton-Yanktonai and Teton Sioux tribes; however, as the buffalo began to disappear in the early 19th century, deer, fish and small mammals were also hunted by the Santee and the Yankton-Yanktonai. The Teton also hunted elk, deer, pronghorn, bighorn sheep, carnivores and rabbits. Tool kits varied within each ecozone, as expected; however, all three tribes continued to use the bow and arrow as their primary hunting implement. The Santee also gathered fruits, wild rice, wild beans, tubers, acorns, nuts and maple sap. Both the Santee and the Yankton-Yanktonai also cultivated corn, beans and squash. On the plains, the Teton gathered wild vegetables and fruits, but traded with the Arikara for their corn, squash and melons.

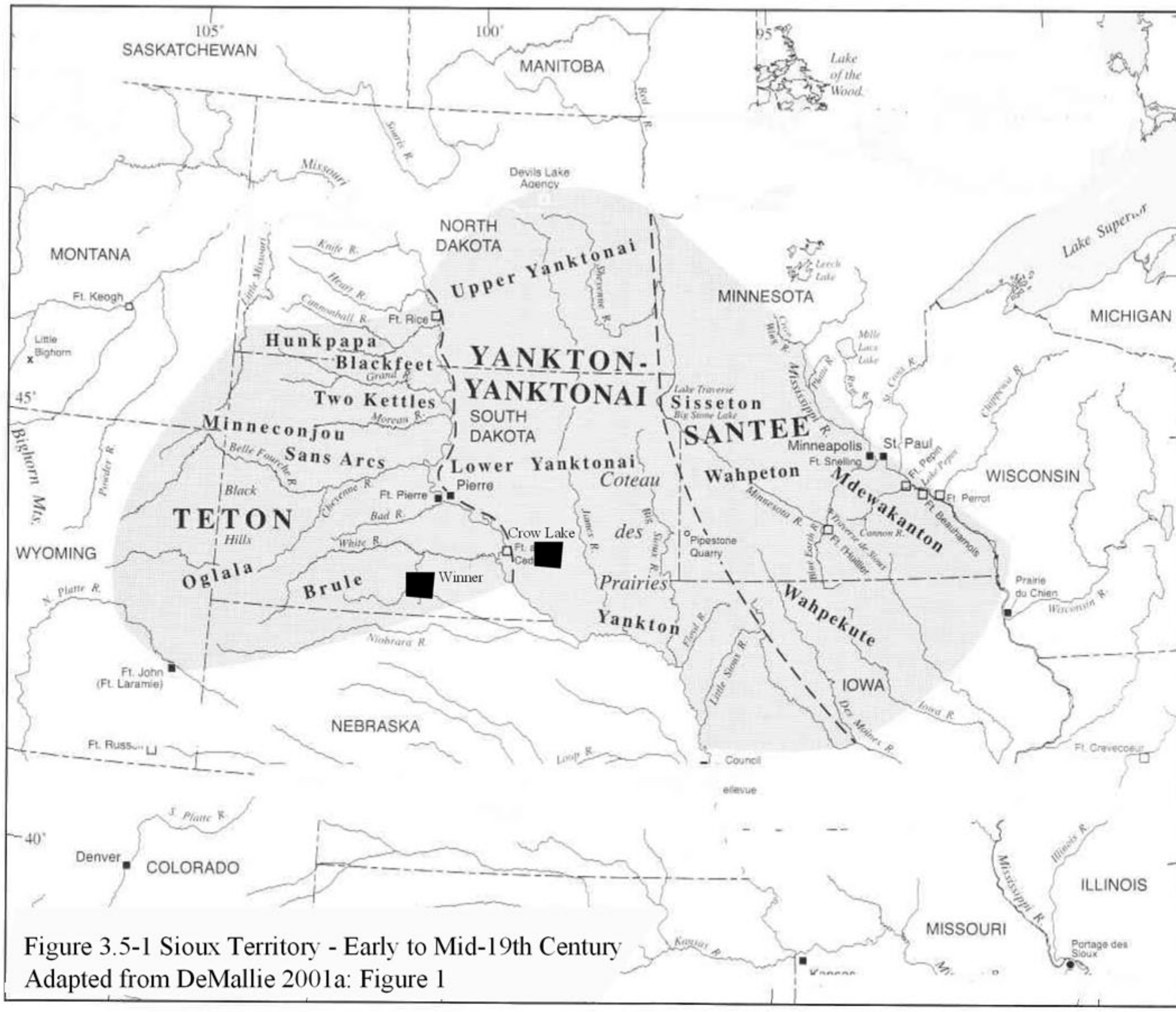


Figure 3.5-1 Sioux Territory – Early to Mid 19th Century

Houses in the forested and prairie areas (Santee and Yankton-Yanktonai) were either bark lodges (Santee) or earthlodges (Yankton-Yanktonai); however, all three tribes used tepees when hunting or living on the Plains.

<u>Hidatsa</u>

The Hidatsa tribe consists of three divisions (Hidatsa proper, Awatixa and Awaxawi). These divisions or village groups were slightly different from each other in culture, and each spoke a distinct dialect. Oral tradition asserts that the Awaxawi and Hidatsa proper came from the east, while Awatixa oral tradition maintains they have always resided on the Missouri River (Stewart 2001:329). Each Hidatsa village consisted of a number of large round earthlodge structures with a strong wooden framework. The earthlodges were generally closely packed together in no particular order. During the communal buffalo hunts (July and August) the people lived in tepees, which were arranged in a camp circle. In the fall people would also form small groups and live in other traditionally established camps where they hunted game and trapped eagles, returning before winter. During the winter the Hidatsa usually split the tribe and established winter camps several miles away from the summer camp. Subsistence for the Hidatsa consisted of buffalo and other large game, fish, corn, sunflower and wild fruits and vegetables.

Mandan

The Mandan lived in villages on the middle Missouri River and lived a lifestyle that combined horticulture and buffalo hunting. By the early 1700s they had well established fortified villages on both sides of the Missouri River near the mouth of the Heart River, likely due to aggressive pressure from other villages and nomadic tribes from the central Plains (Wood and Irwin 2001:349). The Mandan sphere of influence also included a large area to the west that they used in the fall on annual bison hunts and eagle-trapping expeditions. Mandan village locations were chosen for defense. The villages were built on high terraces overlooking the Missouri River floodplain and their gardens were planted in the floodplains. Their earthlodges were arranged around a plaza, which might be located at the edge of the village or at the center. During the winter, the main village was abandoned and temporary villages were established with smaller earthlodges. Subsistence consisted of bison, deer, antelope, elk, small game, waterfowl, fish, corn, beans, squash and sunflowers.

Arikara

The Arikara are the northernmost member of the Caddoan language family, and are considered a divergent dialect of Pawnee (Parks 2001:365). Devastating smallpox epidemics during the late 18th century forced the Arikara to consolidate into two major villages in the area of the Cheyenne and Missouri Rivers in South Dakota. Over the next century they continued to move north along the Missouri River ending up eventually on the Fort Berthold Reservation in North Dakota in 1862.

Prior to the time of the epidemics the Arikara engaged in large communal buffalo hunts that probably extended westward onto the plains. It is believed that during the historic period the pressures of population loss and warfare caused them to concentrate their subsistence practices on horticulture and trading within the vicinity of their villages. Villages were placed on high terraces overlooking the Missouri River and contained between 30 to several hundred lodges, surrounded by a ditch and earthen embankment (Parks 2001:368).

The Arikara buried their deceased on the prairie beyond the village in mounded graves. These village cemeteries were often one mile in length. The Arikara occasionally placed shrines outside the village on the prairie. During the fall the Arikara left the permanent village and established a smaller, identical village in the bottomlands of the Missouri River for the winter months. The people lived in tepees during the communal buffalo hunts. Subsistence practices consisted of hunting and fishing. Buffalo were the most important game animal; however, other important sources of meat included antelope, deer, elk, smaller prey and fish. Corn was the most important crop, with as many as 11 varieties being grown. Beans, squash, melons, sunflower and tobacco were also grown. Wild plants and fruits were also gathered.

Religious Concerns

The Santee, Yankton-Yanktonai and Teton Sioux tribes, like most Native people, lived their lives with ceremony. Ethnographic accounts of the Sioux tribes suggest that the Proposed Project area may contain sensitive sites where sweatlodge, Sun Dance, vision quests, ritual fasting, life cycle events including surface remains or secondary pit burials, or eagle trapping ceremonies occurred (Albers 2001:768-769; DeMallie 2001b:789-790; DeMallie 2001c:806-808).

Likewise for the Hidatsa, Mandan and Arikara, ceremony was an important part of their lives, especially the “bundles” and associated ceremonies that were an integral part of their tribal and personal identity. The Hidatsa and the Mandan had dance ceremonies similar to the Sun Dance, and the Arikara also had the Sun Dance. All had the eagle-trapping ceremony as well. The Arikara also placed altars outside their villages on the prairie and constructed village cemeteries in the form of mounds also outside the villages (DeMallie 2001b; Parks 2001: 379-383; Stewart 2001:335-337; Wood and Irwin 2001:357-359).

Archaeologists are able to record the material remains of these sites; however, the religious or cultural significance of these types of sites, if encountered, can only be determined by the tribes.

Federal Responsibilities

Western is the lead Federal agency for the Section 106 process of the NHPA for the Proposed Project. To date, the Agencies have participated in three government- to-government meetings with the tribes on June 24, 2009, August 5, 2009, and September 29, 2009, to discuss the Proposed Project and tribal concerns. Based on the consultation meetings with Native American tribes the following concerns were identified:

- The need for Native American monitors during pedestrian surveys
- The need for a TCP survey that would include tribal elders and other tribal representatives
- The need for cultural sensitivity training for the construction crew
- The potential for historical significance and concerns in the area surrounding the Winner Alternative

Following the government–to-government consultation meetings, a record search was conducted by the Rosebud Sioux Tribe Historic Preservation Office in August 2009 for the Winner Alternative. The results indicated that there was no TCPs recorded in the tribe’s database within the Proposed Project area. However, it is the view of the tribe that this does not preclude the possibility of archaeological sites being present within the Proposed Project area **(Appendix D).**

A TCP study is proposed and will be conducted by consulting tribes prior to construction.

3.5.2 PREVIOUS RESEARCH

The Class I inventory included a review of existing cultural resources documentation on file in State repositories, a preliminary architectural history windshield survey within the Proposed

Project alternatives, and a review of 19th century Public Land Survey maps. The Class I study area included the area within the alternative boundaries as well as a one-mile buffer. The resulting report, *Class I Cultural Resources Inventory for the PrairieWinds SD1 Project, Aurora, Brule, Jerauld, and Tripp Counties, South Dakota* (Mitchell 2009), is summarized below.

3.5.2.1 Crow Lake Alternative

Six previous cultural resource surveys have been conducted within the Crow Lake Alternative area **(Figure 3.5-2)**. **Table 3.5-1** provides a summary of the six previous cultural resource surveys including author, year and general location of survey.

As a result of the previous surveys, six cultural resource sites were recorded. Site types include stone rings, foundations, farmsteads, a depression and an earthlodge village. Of these sites, one is recommended eligible by SHPO for the NRHP, two are recommended as not eligible and the eligibility of the remaining three sites is undetermined. **Table 3.5-2** provides a summary of the cultural site type, eligibility and general location.

Historic structures identified from previous investigations **(Table 3.5-1)** were also recorded within one mile of the Crow Lake Alternative, and include the Patten Consolidated School, Underwood United Methodist Church, David Grieve Place, H.C. Lyle Farm, Jerry Bennett Farm and the Elwood C. Lyle Wind Powered Mill. **Table 3.5-3** provides a summary of the historic structure type, eligibility and general location.

Table 3.5-1 Crow Lake Alternative Previous Cultural Resource Surveys

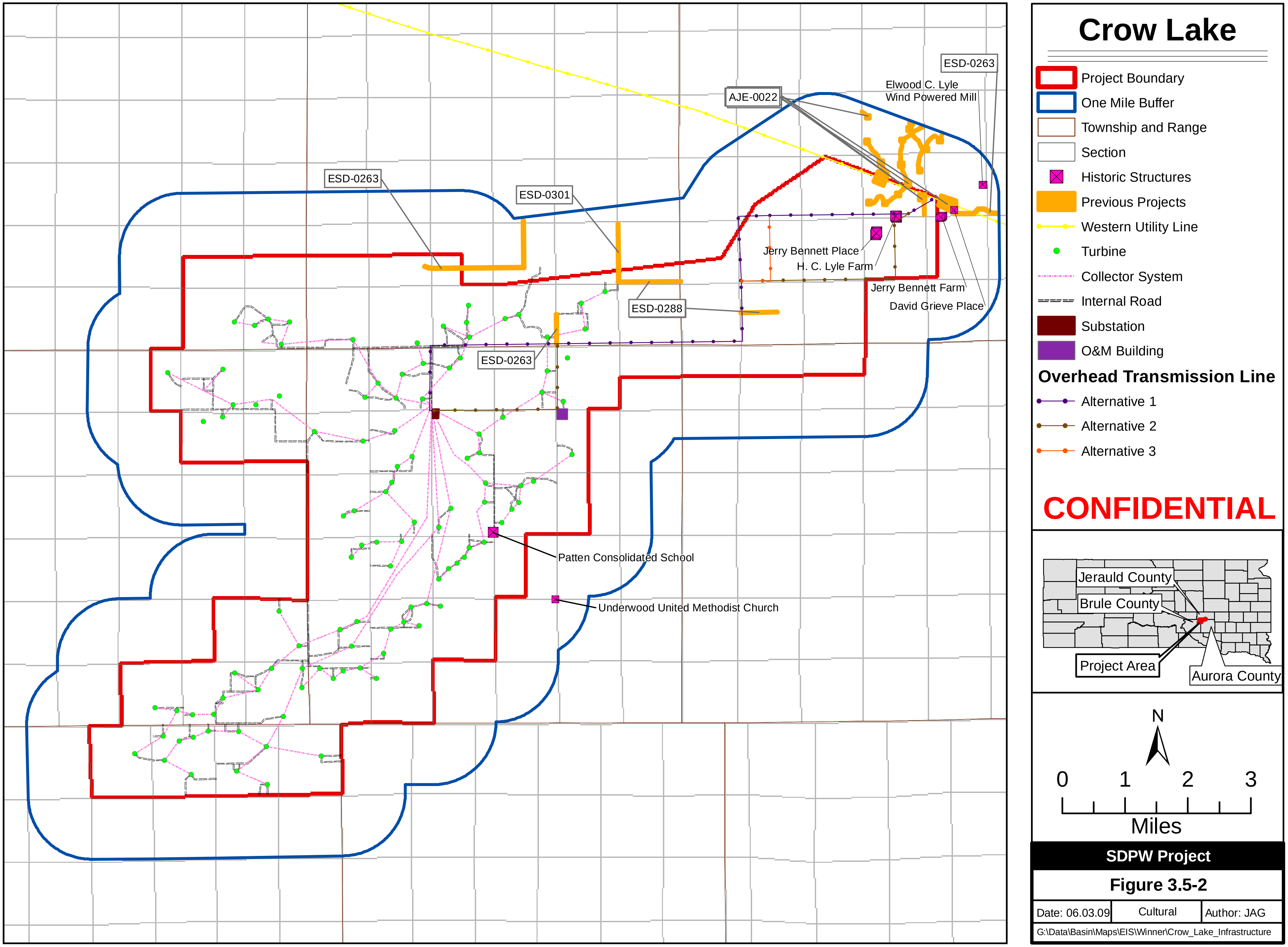
Survey	Author	Year	Location
AAU-0017	Vaillancourt	2006	Within Proposed Project boundary and one-mile buffer
AJE-0022	Vaillancourt	2008	Within Proposed Project boundary and one-mile buffer
ESD-0263	Buechler	2001	Within Proposed Project boundary and one-mile buffer
ESD-0288	Buechler	2002	Within Proposed Project boundary and one-mile buffer
ESD-0301	Buechler	2003	Within Proposed Project boundary and one-mile buffer
ESD-0068	Buechler	1986	Within Proposed Project boundary and one-mile buffer
JExx11	Petrosky Letter (burials)	No Date	Within one-mile of Proposed Project boundary

Table 3.5-2 Crow Lake Alternative Cultural Resource Sites

Site	Site Type	NRHP Eligibility	Location
39AU0007	Foundation	Eligible	Within Proposed Project boundary
39AU0012	Farmstead	Not eligible	Within Proposed Project boundary
39JE0039	Stone Circle	Unevaluated	Within Proposed Project boundary
39JE0044	Foundation	Not eligible	Within Proposed Project boundary
39JE0001	Earthlodge Village	Unevaluated	Within one-mile of Proposed Project boundary
39JE0037	Depression	Unevaluated	Within one-mile of Proposed Project boundary

Table 3.5-3 Crow Lake Alternative Historic Structures

Structure	Type	NRHP Eligibility	Location
AU00000059	Patten Consolidated School	Eligible	Within Proposed Project boundary and one-mile buffer
AU00000060	Underwood United Methodist Church	Eligible	Within one-mile of Proposed Project boundary
JE00000040	David Grieve Place	Not eligible	Within one-mile of Proposed Project boundary
JE01200001	H. C. Lyle Farm	Not eligible	Within Proposed Project boundary and one-mile buffer
JE01200002	H. C. Lyle Farm	Not eligible	Within Proposed Project boundary and one-mile buffer
JE01200003	H. C. Lyle Farm	Not eligible	Within Proposed Project boundary and one-mile buffer
JE01200004	H. C. Lyle Farm	Not eligible	Within Proposed Project boundary and one-mile buffer
JE01300001	Jerry Bennett Farm	Not eligible	Within one-mile of Proposed Project boundary
JE01300002	Jerry Bennett Farm	Not eligible	Within one-mile of Proposed Project boundary
JE01300003	Jerry Bennett Farm	Not eligible	Within one-mile of Proposed Project boundary
JE01300004	Jerry Bennett Farm	Eligible	Within one-mile of Proposed Project boundary
JE01300005	Jerry Bennett Farm	Not eligible	Within one-mile of Proposed Project boundary
JE01300006	Jerry Bennett Farm	Not eligible	Within one-mile of Proposed Project boundary
JE01300007	Jerry Bennett Farm	Not eligible	Within one-mile of Proposed Project boundary
JE01300008	Jerry Bennett Farm	Not eligible	Within one-mile of Proposed Project boundary
JE01300009	Jerry Bennett Farm	Not eligible	Within one-mile of Proposed Project boundary
JE01400001	Elwood C. Lyle Wind Powered Mill	Eligible	Within one-mile of Proposed Project boundary
JE01400002	Elwood C. Lyle Wind Powered Mill	Not eligible	Within one-mile of Proposed Project boundary
JE01500001	Jerry Bennett Place	Not eligible	Within Proposed Project boundary and one-mile buffer
JE01500002	Jerry Bennett Place	Not eligible	Within Proposed Project boundary and one-mile buffer
JE01500003	Jerry Bennett Place	Not eligible	Within Proposed Project boundary and one-mile buffer
JE01500004	Jerry Bennett Place	Not eligible	Within Proposed Project boundary and one-mile buffer
JE01500005	Jerry Bennett Place	Not eligible	Within Proposed Project boundary and one-mile buffer



Due to engineering considerations, the transmission line Alternative 1 location includes area outside of the Crow Lake Alternative boundary; this boundary will be revised to include the transmission line route in the FEIS.

3.5.2.2 Winner Alternative

Nine previous cultural resource surveys have been conducted within the Winner Alternative area **(Figure 3.5-3)**. **Table 3.5-4** provides a summary of the nine previous cultural resource surveys including author, year and general location of survey.

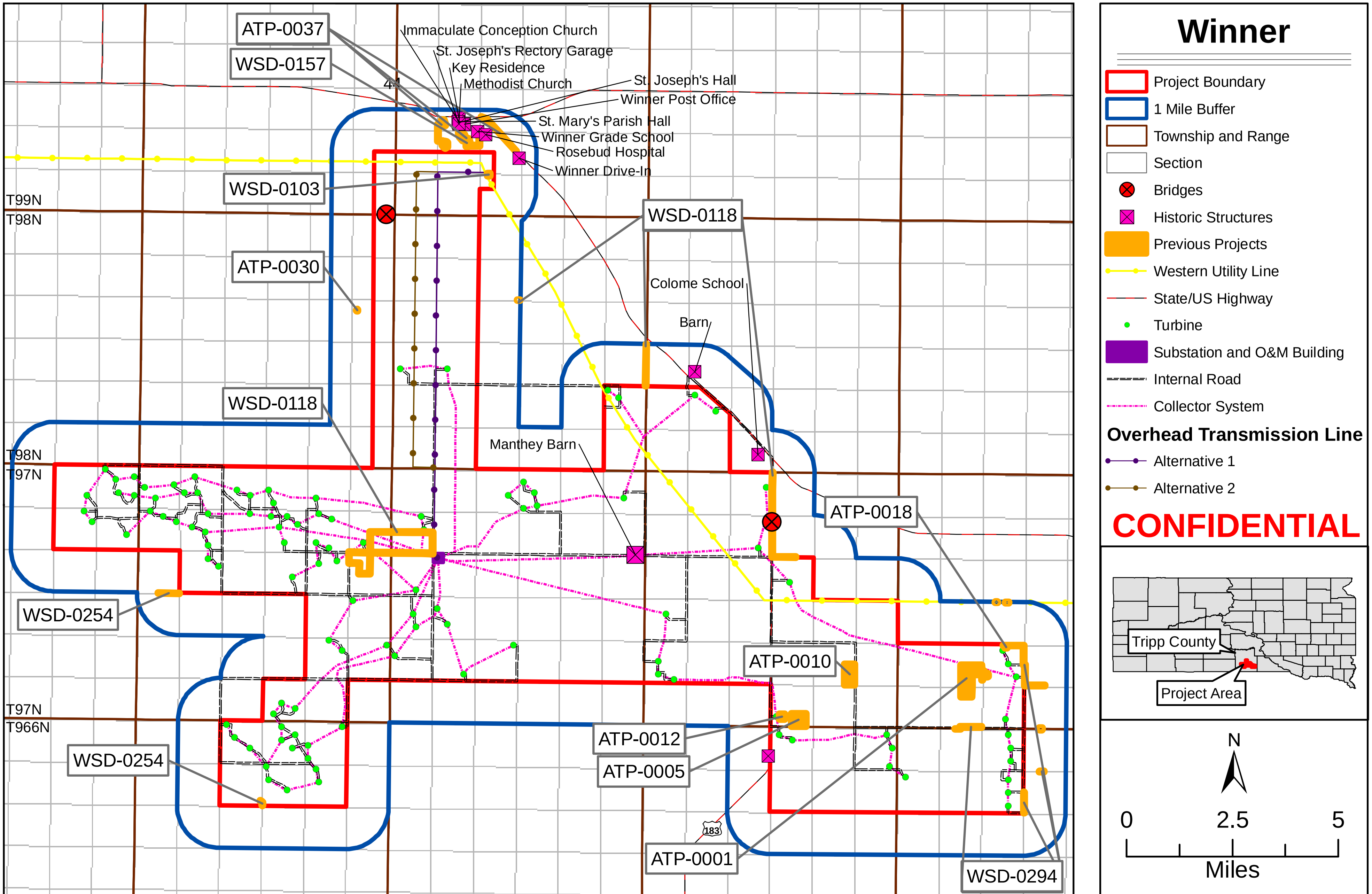
As a result of the previous surveys, 13 sites were recorded. Site types include cairns, farmsteads, isolated finds, a schoolhouse foundation and an artifact scatter. Of these sites, seven are recommended as not eligible, and the eligibility of the remaining six sites is undetermined. **Table 3.5-5** provides a summary of the cultural site type, eligibility and general location.

Table 3.5-4 Winner Alternative Previous Cultural Resource Surveys

Survey	Author	Year	Location
ATP-0001	Haberman	1982a and 1982b	Within Proposed Project boundary
ATP-0005	Haberman	1985	Within Proposed Project boundary
ATP-0010	Haberman	1982a and 1982b	Within Proposed Project boundary
ATP-0012	Haberman	1987	Within Proposed Project boundary
ATP-0018	Chevance	1991a and 1991 b	Within Proposed Project boundary and one-mile buffer
ATP-0030	Armitage	2003	Within Proposed Project boundary and one-mile buffer
ATP-0037	Buechler	2005	Within Proposed Project boundary and one-mile buffer
WSD-0103	Chevance	1991a and 1991 b	Within Proposed Project boundary and one-mile buffer
WSD-0118	Buechler	1992	Within Proposed Project boundary and one-mile buffer

Table 3.5-5 Winner Alternative Cultural Sites

Site	Site Type	NRHP Eligibility	Location
39TP0019	Cairn	Unevaluated	Within Proposed Project boundary
39TP0020	Cairn	Not eligible	Within Proposed Project boundary
39TP0026	Farmstead	Unevaluated	Within one-mile of Proposed Project boundary
39TP0027	School Foundation	Unevaluated	Within Proposed Project boundary
39TP0028	Farmstead	Not eligible	Within Proposed Project boundary
39TP0034	Farmstead	Not eligible	Within one-mile of Proposed Project boundary
39TP0035	Farmstead	Unevaluated	Within Proposed Project boundary
39TP0036	Farmstead	Unevaluated	Within Proposed Project boundary
39TP0038	Foundation	Unevaluated	Within Proposed Project boundary
39TP0055	Farmstead	Not eligible	Within Proposed Project boundary
39TP0056	Isolated find	Not eligible	Within Proposed Project boundary and one-mile buffer
39TP0057	Isolated find	Not eligible	Within Proposed Project boundary
39TP0058	Artifact scatter	Not eligible	Within Proposed Project boundary



SDPW Project

Figure 3.5-3

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Historic structures identified from previous investigations were also recorded within one mile of the Winner Alternative, primarily from the Town of Winner. Fourteen structures were located within one mile, and seven are recommended as eligible for the NRHP. **Table 3.5-6** provides a summary of the historic structure type, eligibility and general location.

Also recorded within one mile of the Winner Alternative were two bridges. Both are recommended as not eligible. **Table 3.5-7** provides a summary of the eligibility and general location.

Table 3.5-6 Winner Alternative Historic Structures

Structure	Type	NRHP Eligibility	Location
TP00000001	Key Residence	Eligible	Within one-mile of Proposed Project boundary
TP00000002	Winner Post Office	Eligible	Within one-mile of Proposed Project boundary
TP00000006	Colome School	Not eligible	Within one-mile of Proposed Project boundary
TP00000010	Manthey Barn	Eligible	Within Proposed Project boundary
TP00000020	Barn	Not eligible	Within one-mile of Proposed Project boundary
TP00000021	Barn	Not eligible	Within one-mile of Proposed Project boundary
TP00000065	Winner Drive-In	Eligible	Within one-mile of Proposed Project boundary
TP00000066	Immaculate Conception Church	Eligible	Within one-mile of Proposed Project boundary
TP00000067	St. Joseph's Hall	Not eligible	Within one-mile of Proposed Project boundary
TP00000068	St. Joseph's Rectory Garage	Not eligible	Within one-mile of Proposed Project boundary
TP00000069	St. Mary's Parish Hall	Eligible	Within one-mile of Proposed Project boundary
TP00000070	Methodist Church	Not eligible	Within one-mile of Proposed Project boundary
TP00000071	Winner Grade School	Eligible	Within one-mile of Proposed Project boundary
TP00000072	Rosebud Hospital	Not eligible	Within one-mile of Proposed Project boundary

Table 3.5-7 Winner Alternative Recorded Bridges

Bridge	SHPO Number	NRHP Eligibility	Location
62-178-300	TP00000039	Not eligible	Within Proposed Project boundary
62-270-372	TP00000055	Not eligible	Within Proposed Project boundary and one-mile buffer

3.6 LAND USE

The ROI for land use includes areas of immediate disturbance associated with the Proposed Project Components and proposed Federal actions. Land uses such as agriculture, designated prime farmland and farmland of statewide importance, rangeland, natural resource conservation areas, residential uses and recreational opportunities were identified within the alternatives.

3.6.1 GENERAL LAND USE

The majority of the region, including both Proposed Project alternatives, is currently used for rangeland and agriculture. Western's Wessington Springs and Winner substations are industrial uses. Reviews of aerial photographs, existing public inventories (*e.g.*, USFWS, NWI, NRCS databases) and field studies were used to identify the land uses within the sites. Tierra EC contacted Aurora, Brule, Jerauld and Tripp county planners and managers to inquire whether existing land use plans for the counties were available (Hirsh 2009b) (Reindle 2009b) (Vissia 2009b) (Westindorf 2009b). Land use plans for Aurora and Brule counties are currently being revised. Jerauld County's Comprehensive Plan was approved in 1998. No land use plan is available for Tripp County.

3.6.1.1 Crow Lake Alternative

Table 3.6-1 and **Figure 3.4-1** (in **Section 3.4**) identify current land uses at the Crow Lake Alternative.

Table 3.6-1 Crow Lake Alternative Current Land Use

Land Use	Percentage of Area
Rangeland (mixed-grass prairie)	64%
Agricultural (cropland)	33%
Wetland	1.4%
Farmstead	<1%
Shelterbelt	<1%
Deciduous forest	<1%
Industrial (mine/quarry)	<1%

Source: Tierra EC 2009

3.6.1.2 Winner Alternative

Table 3.6-2 and **Figure 3.4-3** (in **Section 3.4**) identify current land uses at the Winner Alternative.

Table 3.6-2 Winner Alternative Current Land Use

Land Use	Percentage of Area
Rangeland (mixed-grass prairie)	69%
Agricultural (cropland)	29%
Deciduous forest	1.8%
Farmstead	1.6%
Shelterbelt	1.5%
Wetland	1.1%
Disturbed	<1%

Source: Tierra EC 2009

3.6.2 PRIME FARMLAND AND FARMLAND OF STATEWIDE IMPORTANCE

The Federally-implemented Farmland Protection Policy Act (FPPA) is a set of programs and policies designed to protect farmland from urban sprawl. The FPPA created a system to classify farmland uses with categories that include prime farmland, unique farmland and farmland of statewide or local importance. FPPA requirements govern projects that may irreversibly convert farmland either directly or indirectly to nonagricultural use and are completed under the auspices of a Federal agency process. The FPPA does not authorize the Federal government to affect the property rights of private landowners or regulate the use of private land.

3.6.2.1 Crow Lake Alternative

The NRCS Soil Survey Geographic (SSURGO) Database (NRCS 2009) identifies 912 acres of prime farmland and 20,027 acres of farmland of statewide importance within the Crow Lake Alternative. If the Proposed Project is approved the post-construction facilities at the Crow Lake Alternative would cover less than two acres of prime farmland and less than 100 acres of farmland of statewide importance.

3.6.2.2 Winner Alternative

The SSURGO Database (NRCS 2009) identifies 132 acres of prime farmland and 10,930 acres of farmland of statewide importance within the Winner Alternative. If the Proposed Project is approved the post-construction facilities at the Winner Alternative would cover less than one acre of prime farmland and less than 60 acres of farmland of statewide importance.

3.6.3 CONSERVATION EASEMENTS

Areas within the Proposed Project alternatives include lands that are encumbered by perpetual easements administered by the USFWS for conservation. The USFWS has been purchasing conservation easements in the prairie pothole region since 1958 as an approach to waterfowl habitat management. These conservation easements are minimally restrictive instruments that grant the USFWS the ability to protect the grassland and wetland habitat on the properties where these easements are recorded. Easements are administered as part of the National Wildlife Refuge System, acquired as an alternative to fee-title acquisition and intended to perpetually protect grasslands and wetlands to benefit migratory birds and other wildlife.

3.6.3.1 Crow Lake Alternative

USFWS conservation easements within the Crow Lake Alternative boundary include 2,836 acres of Wetland Easement and 1,629 acres of Grassland Easement. The areas preserved account for 12 percent of the site in total, and are scattered throughout, as depicted in **Figure 3.4-2**. The conservation easements are further discussed in **Section 3.4**.

3.6.3.2 Winner Alternative

USFWS conservation easements within the Winner Alternative boundary include one 220-acre parcel identified as Grassland Easement west of the City of Colome, as depicted in **Figure 3.4-4**. This parcel amounts to 0.26 percent of the area included in the site. The conservation easements are further discussed in **Section 3.4**.

3.6.4 RESIDENTIAL USE

3.6.4.1 Crow Lake Alternative

The Crow Lake Alternative contains a total of 27 residences; each within a farmstead property, and may be occupied permanently, seasonally or for recreational/hunting purposes. The total farmstead acreage constitutes less than one percent of the acreage of the site. No residences are within 1,000 feet of the proposed turbine locations. The closest residence is approximately 1,270 feet away from a proposed turbine. The closest residence to the proposed transmission line right-of-way would be located approximately 1,900 feet away. The nearest residence to the alternative transmission corridor right-of-way is at least 2,800 feet away. The nearest residence to the proposed collector substation would be located approximately 6,700 feet away. The nearest residence to Western's existing Wessington Springs Substation is 1,500 feet away.

3.6.4.2 Winner Alternative

The Winner Alternative contains a total of 127 residences; each included within a farmstead property, and may be occupied permanently, seasonally or for recreational/hunting purposes. The total farmstead acreage constitutes less than 1.6 percent of the acreage of the site. One residence is located within 1,000 feet of a proposed turbine location, at a distance of approximately 800 feet. All other residences are located more than 1,000 feet from proposed turbine locations. The closest residence to a proposed transmission line is 100 feet away from the proposed transmission corridor centerline. The closest residence to an alternative transmission line is 900 feet away from the alternative transmission corridor centerline. The nearest residence to the proposed collector substation would be located approximately 1,400 feet away. The nearest residence to Western's existing Winner Substation is 300 feet away.

3.6.5 RECREATION

Recreational opportunities in the vicinity of each of the Proposed Project alternatives are the same. According to the South Dakota Division of Parks and Recreation (SDDPR) many outdoor recreation activities are available to the public within the State (*i.e.*, fishing, camping, off-highway vehicle use, Lewis and Clark exploration activities); these activities include a wide range of options depending on the time of year and specific interest. Hunting in South Dakota is a popular recreational activity that can be experienced year-round, on nearly five million acres of public land (SDDPR 2009), and is popular within the alternatives.

Pheasant and other upland game hunting, waterfowl hunting, small game, and deer hunting seasons all open in the fall. Late season deer and predator hunting occur during the winter months. In the spring, hunters can participate in turkey and light goose seasons. In the off-season, prairie dog hunting and other varmint hunting are permitted on private land (with permission).

3.7 TRANSPORTATION

The ROI for roads and highways includes existing and proposed roads near the Proposed Project alternatives that would be used for delivery of construction equipment, construction worker access and maintenance access. The ROI for aviation includes airports within 20 miles.

3.7.1 ROADS AND HIGHWAYS

This section includes an evaluation of current road conditions and aviation activities near the Proposed Project alternatives. Information used to develop this section includes regional transportation planning documents from SDDOT. Information pertaining to aviation safety standards was obtained from FAA.

Table 3.7-1 provides a brief inventory of the status and trends of the regional road infrastructure for each of the Proposed Project alternatives.

Table 3.7-1 Regional Roadways

Roadway	Lane Count / Surface Type	Aurora County	Brule County	Jerauld County	Tripp County
Crow Lake Alternative					
Interstate 90	Four-lane / paved	X	X		
State Route 34	Two-lane / paved			X	
State Route 42	Two-lane / paved	X			
State Route 45	Two-lane / paved		X		
State Route 50	Two-lane / paved		X		
State Route 224	Two-lane / paved			X	
U.S. Highway 281	Two-lane / paved	X		X	
County Road 11	Two-lane / paved	X		X	
Winner Alternative					
State Route 44					X
State Route 49	Two-lane / paved				X
State Route 53					X
U.S. Highway 18					X
U.S. Highway 183	Two-lane / paved				X

3.7.1.1 Crow Lake Alternative

County and township (section line) roads characterize the existing roadway infrastructure in and around the Crow Lake Alternative. The site is crossed and accessible by County Road (CR) 11. CR11 is a two-lane paved roadway intersecting Interstate 90 (I-90) to the south, and State Route (SR) 34 to the north. The general alignment of this road is straight and flat. No average daily traffic (ADT) counts are available for CR11. According to the latest available SDDOT 2009 ADT counts, the following list provides the ADT for the major roads that cross or are near the Crow Lake Alternative (**Figure 3.7-1**):

- I-90, south of the Crow Lake Alternative: average of greater than 2,500 ADT
- SR45, west of the Crow Lake Alternative: average of 401 to 1,025 ADT
- SR34, north of the Crow Lake Alternative: average of 401 to 1,025 ADT
- U.S. Highway (US) 281, east of the Crow Lake Alternative: average of 551 to 1,500 ADT

3.7.1.2 Winner Alternative

The Winner Alternative is crossed or accessible via SR44, SR49, SR53, US183 and US18. In addition, I-90 is located to the north of Tripp County, and SR47 is located to the east of Tripp County. The highways are mostly two-lane paved roadways, with general linear alignments, and collectively extend in multiple directions for access to the site (**Figure 3.7-2**).

According to the latest available ADT (SDDOT 2008), the following list provides the ADT for the major roads crossing or near the Winner Alternative:

- SR44, north of the Winner Alternative: of 960 to 1460 ADT
- SR49, northeast of the Winner Alternative: of 401 to 1,025 ADT
- SR53, west of the Winner Alternative: of 0 to 250 ADT

- US183, crossing the Winner Alternative in an north / south direction: of 125.5 to 400 ADT
- US18, northeast of the Winner Alternative: of 1,501 to 2,500 ADT

3.7.2 AVIATION

3.7.2.1 Crow Lake Alternative

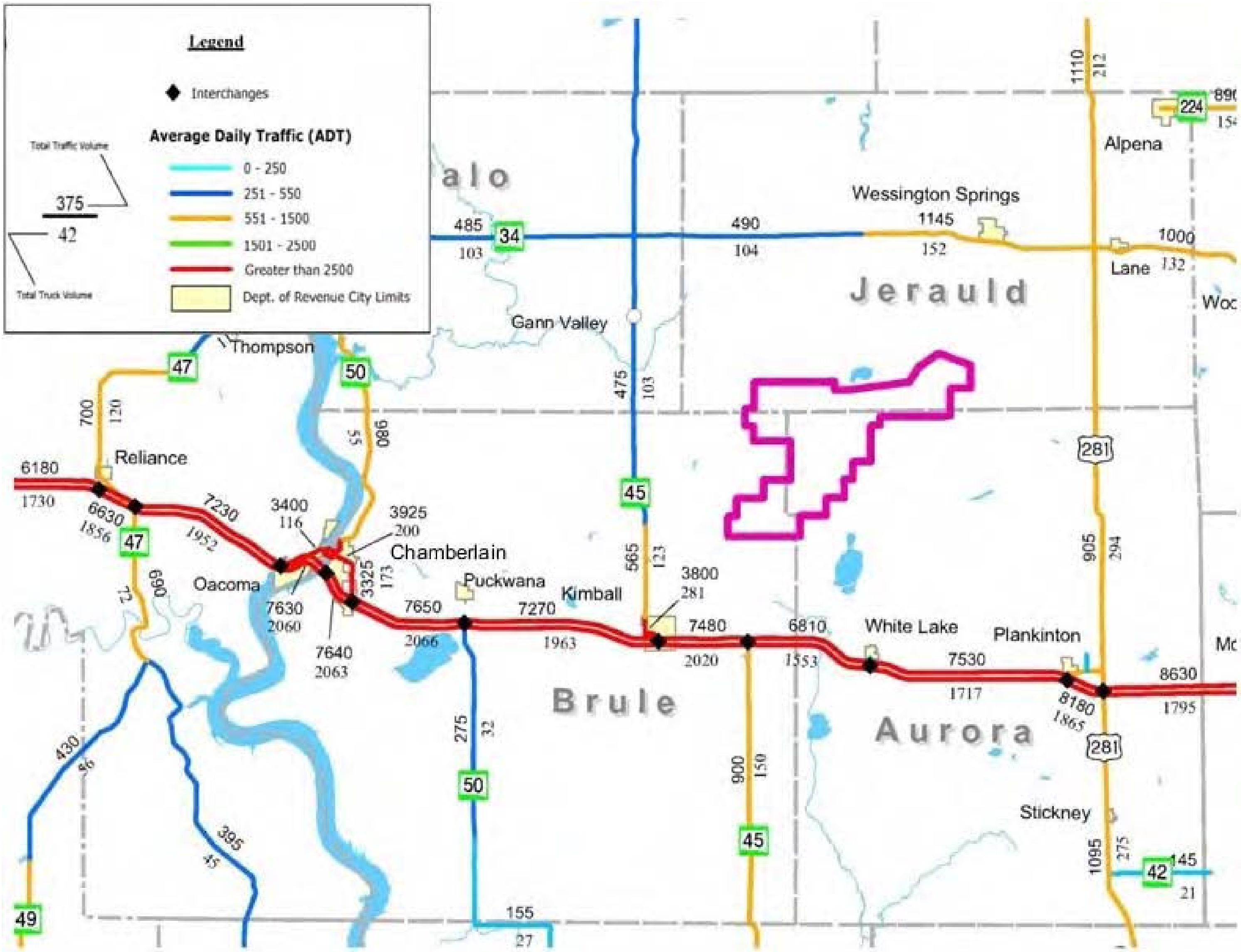
Three airports are within 20 miles of the Crow Lake Alternative. The Wessington Springs Airport and Kimball Municipal Airport are municipal airports serving the local communities, with less than 300 takeoffs/landings per year each (SDDOT Aeronautics 2007). Drake Farm is a farm airfield used for local agricultural purposes (annual reporting of takeoffs/landings was unavailable for this airfield).

- Wessington Springs Airport: Public airport near the Town of Wessington Springs, approximately eight miles from the site
- Kimball Municipal Airport: Public airport near the City of Kimball, approximately seven miles from the site
- Drake Farm: Private airport used primarily for agricultural purposes near the City of White Lake, approximately nine miles from the site

3.7.2.2 Winner Alternative

Two airports and one helipad are within 20 miles of the Winner Alternative. The Winner Regional Airport is used for takeoffs/landings over 20,000 times per year, with nearly half of that being local traffic staying within 20 miles; and the Gregory Municipal Airport is less heavily used at 6,500 takeoffs/landings per year, nearly a third of which is local traffic (SDDOT Aeronautics 2009).

- Winner Regional Airport: Public airport near the City of Winner, approximately two miles from the site
- Gregory Municipal Airport, Flynn Field: Public airport near the City of Gregory, approximately nine miles from the site
- Burke Hospital Helipad: Private Helipad used for hospital emergency rescue services, near the City of Burke, approximately 16 miles from the site



Source: SDDOT 2008

Figure 3.7-1 Crow Lake Alternative Traffic Flow Map

Source: SDDOT 2008

Figure 3.7-2 Winner Alternative Traffic Flow Map

3.8 VISUAL RESOURCES

This section evaluates the existing visual setting in the vicinity of the alternatives. The ROI includes areas within and adjacent to the Proposed Project area from which a person may observe changes to the visual landscape resulting from development of the Proposed Project Components. These areas include residences within the alternative site boundaries, nearby population centers and nearby roadways.

3.8.1 EXISTING VISUAL SETTING

The following aesthetic values were considered when evaluating the visual setting of the existing landscape:

- Form: topographic variation, mountains and valleys
- Line and pattern: roads and transmission lines
- Color and contrast: brightness and diversity
- Texture: vegetation, buildings and disturbed areas

3.8.1.1 Crow Lake Alternative

Topography of the Crow Lake Alternative is characterized by gently rolling hills with low to moderate relief. Elevation ranges from approximately 1,985 to 2,510 feet AMSL. Mixed-grass prairie (including rangeland, pastureland and CRP/prairie) dominates the vegetation. Additional vegetation includes cropland, wetlands (including stock ponds), farmsteads and patches of deciduous trees (mostly shelterbelts) (Tierra EC 2009). Overall, the Crow Lake Alternative is rural in character. The predominant land uses include livestock grazing, farming, sparse farmstead residential development, fencing and a rural road network consisting of paved roads, gravel roads and two-track roads developed primarily on portions of section lines. In addition, the existing Wessington Springs Wind Project, a 51-MW wind energy generating facility, is located adjacent to the northeast edge of the Crow Lake Alternative.

There are 27 farmstead residences located within the boundaries of the Crow Lake Alternative. The Town of Crow Lake is within one mile of the Proposed Project boundary and had a population of 46 at the time of the 2000 census. Kimball, Wessington Springs and White Lake are the only other population centers located within seven to nine miles of the Crow Lake Alternative.

Roadways described in **Section 3.7.3** from which the area may be viewed include I-90, SR45 and SR50 (see **Figure 3.7-1**). A portion of SR50 has been designated as the Native American Scenic Byway. The Native American Scenic Byway extends approximately 357 miles between North Dakota and South Dakota and provides memorial markers, monuments, museums and sacred sites that commemorate the heritage of the Sioux Nation. Portions of I-90 and SR50 are included in the Lewis and Clark Trail Driving Route (LCTDR), which is associated with the Lewis and Clark National Historic Trail (NHT). The Lewis and Clark NHT is administered by NPS. The LCTDR is a network of roads that generally tracks the Lewis and Clark NHT along the Missouri

River and provides vistas as well as historic markers. The Lewis and Clark NHT extends more than 3,700 miles and includes the entire Missouri River from its headwaters in Montana to its confluence with the Mississippi River near St. Louis, Missouri. Under the National Trail System Act and the Organic Act, NPS is charged with preservation of natural scenes and landscapes for enjoyment by future generations.

3.8.1.2 Winner Alternative

The rolling plains of the Winner Alternative include elevation ranges from approximately 1,644 to 1,985 feet AMSL. Mixed-grass prairie (including rangeland, pastureland and CRP/prairie) dominate the vegetation. Additional vegetation includes cropland, wetlands (including herbaceous wetlands, forested wetlands, stock ponds and lakes), deciduous forests, farmsteads and shelterbelts (Tierra EC 2009). Overall, the Winner Alternative is rural in character. The predominant land uses include livestock grazing, farming, sparse farmstead residential development, fencing and a rural road network consisting of paved roads, gravel roads and two-track roads developed primarily on portions of section lines.

There are 127 farmstead residences within the boundaries of the Winner Alternative. The towns of Winner and Colome are within one mile of the project boundary and had a population of 3,137 and 333, respectively, at the time of the 2000 census. Clearfield, Dallas and Gregory are the population centers within three to nine miles of the Winner Alternative.

Roadways described in **Section 3.7.3** from which the area may be viewed include I-90, SR44, SR47 and US18 (see **Figure 3.7-2**). In the vicinity of the Winner Alternative, portions of SR44 and US18 are included in the LCTDR.

3.8.2 KEY OBSERVATION POINTS

Key observation points (KOPs) were selected to depict the general visual setting of each of the alternatives and provide a baseline for developing visual simulations (presented in **Section 4.8**). Based on public input received during the EIS scoping process, local (*i.e.*, residents within and near the alternative site boundaries) sensitivity to visual changes as a result of the Proposed Project is low. Therefore, KOPs were selected for each of the alternatives based on topography and the potential to view the Proposed Project from the LCTDR and associated interpretive center. The foreground (area within three to five miles) and background (area further than three to five miles) are described for each KOP. **Figure 3.8-1** depicts the locations of the KOPs in relation to the alternatives and LCTDR.

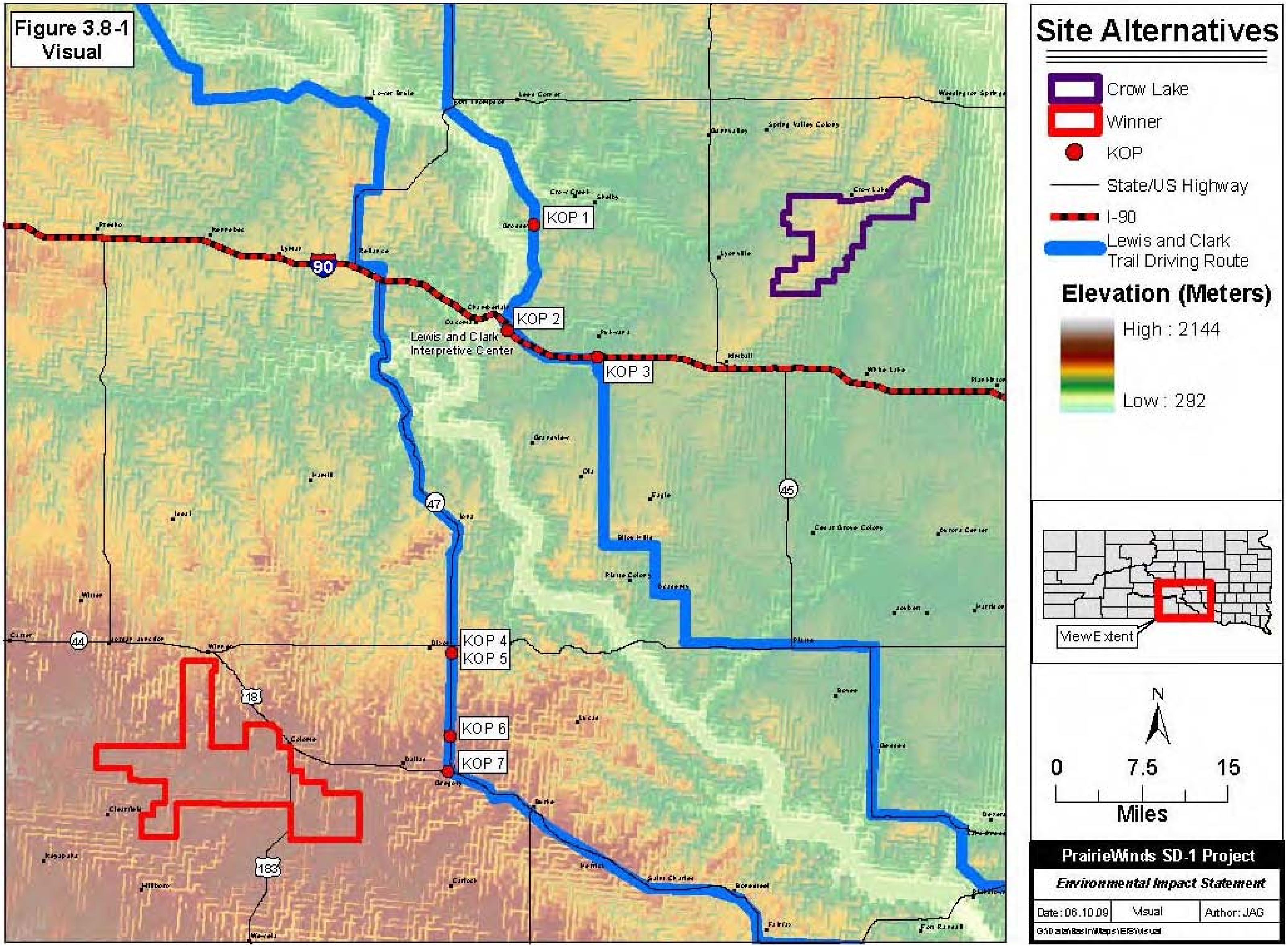


Figure 3.8-1 Key Observation Points

3.8.2.1 Crow Lake Alternative

Three KOPs were identified for the Crow Lake Alternative. KOP 1 was identified as one of the areas with the highest elevation along SR50 that could provide a view of the Proposed Project to users of the LCTDR. KOP 1 is approximately 22 miles west of the Crow Lake Alternative and is located near Grosse, South Dakota. This KOP is representative of the Crow Lake Alternative and regional area. **Figure 3.8-2** below represents the existing visual condition from KOP 1; the view is to the east. The foreground includes property fencing, gravel road, mixed grasses, individual trees and agriculture. The background includes the gravel road, mixed grasses and a shelter belt (*i.e.*, trees planted in a row to create a wind and/or snow break). An existing transmission line is visible on the horizon.

Figure 3.8-2 KOP 1 Existing Condition

KOP 2 is the Lewis and Clark Interpretive Center (LCIC), located in the Chamberlain Rest Area on I-90 between exits 263 and 265. The LCIC is approximately 24 miles west of the closest point of the Crow Lake Alternative. KOP 2 depicts the view to the northeast from the LCIC. **Figure 3.8-3** below shows the existing visual condition from KOP 2. The foreground includes mixed grasses, I-90, shrubs, trees, billboards and two buildings. The background includes mixed grasses, shrubs and trees. One building, one communication tower and stadium lights are visible on the horizon.

Figure 3.8-3 KOP 2 Existing Condition

KOP 3 is the view northeast from near the intersection of I-90 and SR50, where the LCTDR is at its closest point (17 miles) to the Crow Lake Alternative. **Figure 3.8-4** below shows the existing condition from KOP 3. The foreground includes I-90 and grasses. The background includes grasses and trees. An existing transmission line is visible on the horizon.

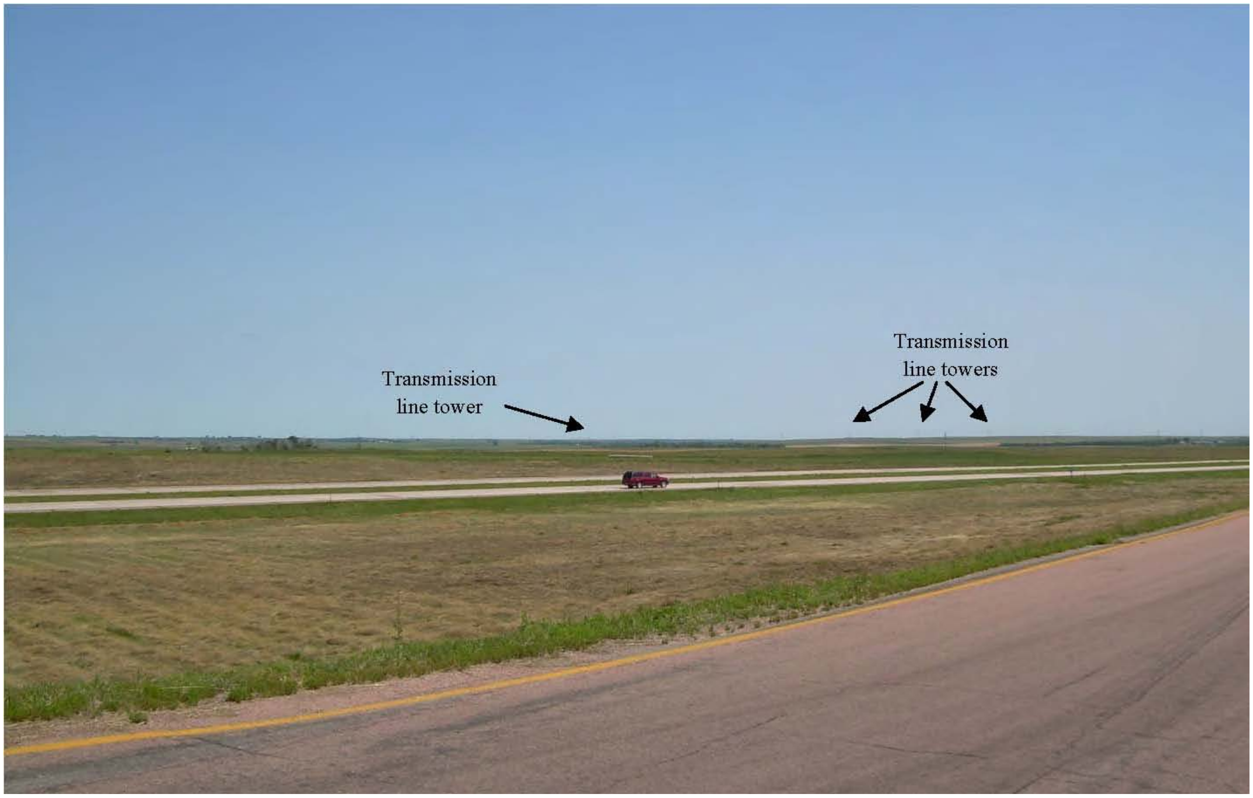


Figure 3.8-4 KOP 3 Existing Condition

3.8.2.2 Winner Alternative

Four KOPs were identified for the Winner Alternative and are representative of the site and surrounding area. KOPs 4 and 5 provide two views from near the intersection of SR44 and SR47. The closest point of the Winner Alternative is approximately 15 miles from KOP 4 and KOP 5. Two views are provided from this location because the location of the site boundary is irregular and the view when facing west is farther from Proposed Project Components when compared with the view when facing southwest. KOP 4 is the view to the west and is farther from Proposed Project Components as compared to KOP 5, which is the view to the southwest.

KOP 4 represents the view to the west. **Figure 3.8-5** below shows the existing condition from KOP 4. The foreground includes SR47, property fencing, mixed grasses, sparse trees and a telephone line. The background includes mixed grasses, agriculture, a shelter belt and sparse buildings.

Figure 3.8-5 KOP 4 Existing Condition

KOP 5 is the view to the southwest. **Figure 3.8-6** below shows the existing condition from KOP 5. The foreground includes SR47, property fencing, hay bales, agriculture, mixed grasses and sparse trees. The background includes mixed grasses, agriculture and hay bales.

Figure 3.8-6 KOP 5 Existing Condition

KOP 6 was identified as one of the areas with the highest elevation along SR47 that could provide a view of the Proposed Project to users of the LCTDR. KOP 6 is approximately 9.6 miles east of the Winner Alternative boundary; the view is to the west. **Figure 3.8-7** below shows the existing condition from KOP 6. The foreground includes SR47, property fencing, agriculture, mixed grasses and sparse shrubs and trees and a stock pond. The background includes mixed grasses, agriculture and farmstead properties.

Figure 3.8-7 KOP 6 Existing Condition

KOP 7 is near the intersection of US18 and SR47, which is located near Gregory, South Dakota. KOP 7 is the nearest point of the LCTDR to the Winner Alternative and is approximately eight miles east of the Winner Alternative boundary. **Figure 3.8-8** below shows the existing condition from KOP 7; the view is to the west. The foreground includes US18, property fencing, agriculture, mixed grasses and sparse trees. The background includes mixed grasses, agriculture and shelter belts. A water tower is visible on the horizon.

Figure 3.8-8 KOP 7 Existing Condition

3.9 NOISE

This section describes the basic measurements used for sound, applicable noise recommendations, and existing sources of noise within the Crow Lake and Winner alternative areas.

3.9.1 FUNDAMENTALS OF SOUND

Noise is defined generally as unpleasant, unexpected or undesired sound that disrupts or interferes with normal human activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to noise is annoyance. An individual's response to noise is influenced by the type of noise, perceived importance of the noise, appropriateness in the setting, time of day, type of activity during which the noise occurs and the sensitivity of the individual.

Intensity of sound is measured in units of decibels (dB) on a logarithmic scale. The A-weighted decibel (dBA) measures sound in a manner similar to the response of the human ear, so that more weight is given to the frequencies that people hear more easily. Typical ranges of common sounds include approximately 60 to 90 dBA for an automobile at a distance of 50 feet, approximately 76 to 89 dBA for a heavy truck at a distance of 50 feet, approximately 80 to 110 dBA for the driver of a motorcycle and approximately 103 to 115 dBA for the operator of a chainsaw (EPA 1979).

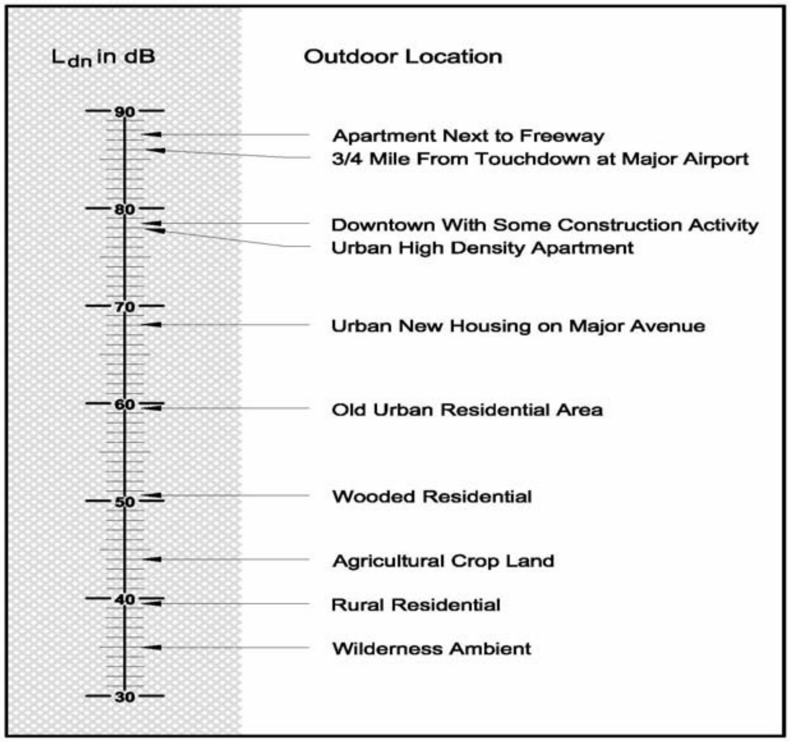
The L_{dn} is the A-weighted average sound level for a 24-hour period. It is calculated by adding a 10 dB "penalty" to sound levels in the night (10 p.m. to 7 a.m.) to compensate for the increased sensitivity to noise during the quieter evening and nighttime hours. Sound levels typical of outdoor areas using the L_{dn} are listed in **Figure 3.9-1**.

3.9.2 APPLICABLE RECOMMENDATIONS

In 1974, the EPA established recommendations to help protect public health and welfare. The EPA identified outdoor L_{dn} levels equal to or less than 55 dBA to prevent activity interference and annoyance (EPA 1974). When annual averages of the daily level are considered over a period of 40 years, the EPA identified average noise levels equal to or less than 70 dBA as the level of environmental noise that will prevent any measurable hearing loss over the course of a lifetime. The EPA-identified levels are recommended guidelines, not regulations. There are no noise codes applicable to wind projects in South Dakota (Reindle 2009c; Steele 2009; Westindorf 2009c).

3.9.3 EXISTING NOISE SOURCES AND SENSITIVE RECEPTORS

Existing sources of noise are similar for both the Crow Lake Alternative and the Winner Alternative; as such, the following discussion applies to both areas.



Source: EPA 1979.

Figure 3.9-1 Typical Sound Levels

The Proposed Project alternatives are located in rural areas, composed primarily of agricultural land use and prairie. The primary sources of noise include agricultural activity (farming equipment), recreation (primarily hunting), wind and vehicles traveling on county roads and low-traffic gravel roads. Based on **Figure 3.9-1**, typical day-night average outdoor noise levels for rural residential and agricultural areas range from 39 dBA to 44 dBA.

Sensitive noise receptors (*e.g.*, residences, schools, hospitals and offices) include sparse residences within the alternatives. The ROI for noise includes residences located within the Proposed Project alternatives and residences adjacent to proposed Federal action areas.

3.9.3.1 Crow Lake Alternative

Twenty-seven residences were identified within the Crow Lake Alternative. The nearest residence to a proposed turbine location would be located approximately 1,270 feet away. The nearest residence to the proposed transmission corridor centerline would be located approximately 1,900 feet away. The nearest residence to the alternative transmission corridor centerline would be located at least 2,800 feet away. The nearest residence to the proposed collector substation would be located approximately 6,700 feet away. The nearest residence to Western's Wessington Springs Substation is 1,500 feet away.

3.9.3.2 Winner Alternative

One-hundred and 27 residences were identified within the Winner Alternative. The nearest residence to a proposed turbine location would be located approximately 800 feet away. The nearest residence to the proposed transmission corridor would be located approximately 100 feet away from the proposed transmission corridor. The nearest residence to the proposed collector substation would be located approximately 1,400 feet away. The nearest residence to Western's Winner Substation is 300 feet away.

3.10 SOCIOECONOMICS

3.10.1 POPULATION TRENDS AND DEMOGRAPHIC CHARACTERISTICS

The socioeconomic analysis for this DEIS evaluated only the counties in which the Proposed Project alternatives are located. While economic effects could occur to additional counties and regions of the U.S., depending on where the specific Proposed Project Components are manufactured, these effects are impossible to determine at this time. For this reason, the ROI for the Crow Lake Alternative is limited to Aurora, Brule and Jerauld counties. The ROI for the Winner Alternative is limited to Tripp County. This section describes the population demographics within the ROI.

Socioeconomic indicators include characteristic demographics, income levels, employment opportunities and quality of life. These are issues that may be affected by construction and operation of the Proposed Project.

The U.S. Census Bureau, South Dakota Department of Labor (SDDL) and other online databases were used to obtain information on population trends and demographics, housing, education, available community services, income data and employment rates.

3.10.1.1 Crow Lake Alternative

Tables 3.10-1 and 3.10-2 below provide a brief inventory of the status and trends of some of the resources that are used as the basis for assessing socioeconomic impacts for the Crow Lake Alternative. Population trends and demographic data were used to set the regional context for the socioeconomic analysis.

The population in the vicinity of the Crow Lake Alternative is small compared to the overall population within South Dakota or the U.S. as a whole.

The nearest population centers to the Proposed Project area are White Lake, approximately 15 miles south with a 2008 population of 378, and Wessington Springs, approximately 17 miles northeast with a 2008 population of 846. These towns have services including hotels, restaurants and public schools; there is a hospital in Wessington Springs. The largest city near the Crow

Table 3.10-1 Crow Lake Alternative Population

Year	Description	United States	South Dakota	Aurora County	Brule County	Jerauld County
Population						
2008	Total population estimates	304,059,724	804,194	2,867	5,205	1,982
2000	Total population estimates	281,421,906	755,657	3,060	5,351	2,279
2008	Population in two largest cities	Aurora County: Plankinton-569, White Lake- 378 Brule County: Chamberlain –2,264, Kimball – 692 Jerauld County: Wessington Springs – 846, Alpena – 225				
2000	Population in two largest cities	Aurora County: Plankinton-601, White Lake- 405 Brule County: Chamberlain – 2338, Kimball – 745 Jerauld Count: Wessington Springs – 1011, Alpena – 265				

Source Data: U.S. Census 2008

Table 3.10-2 Crow Lake Alternative Age and Gender Demographics

Year	Description	South Dakota	Aurora County	Brule County	Jerauld County	Source Data*
2008	Total population estimates	804,194	2,867	5,205	1,982	1
Age						
2006	Under 5 years	52,218	158	307	105	2
2006	5 to 13 years	90,502	336	701	162	2
2006	14 to 17 years	45,550	254	398	115	2
2006	18 to 24 years	86,114	223	464	162	2
2006	15 to 44 years	319,559	993	1,892	668	2
2006	45 to 64 years	192,194	750	1,319	627	2
2006	65 years and over	110,530	612	885	553	2
Sex						
2006	Male	385,620	1,494	2,474	1,065	2
2006	Female	390,313	1,407	2,713	1,071	2

*Source Data: 1 = U.S. Census 2008, 2 = U.S. Census 2006

Lake Alternative is Chamberlain, approximately 23 miles away with a 2008 population of 2,264; additional community populations are provided in the table for comparison.

3.10.1.2 Winner Alternative

Tables 3.10-3 and 3.10-4 provide a brief inventory of the status and trends of some of the resources that are used as the basis for assessing the socioeconomic impacts for the Winner Alternative. Population trends and demographic data were used to set the regional context for the socioeconomic analysis.

The population in the vicinity of the Winner Alternative is small compared to the overall population within South Dakota and the U.S. as a whole, with slightly more females than males.

The nearest cities to the Proposed Project area are Winner, directly north approximately 8 miles, with a 2008 population of 2,744; and Colome, approximately 11 miles southeast, with a 2008 population of 291. These cities have services including hotels, restaurants and public schools; there is a hospital in Winner.

Table 3.10-3 Winner Alternative Population

Year	Description	United States	South Dakota	Tripp County
Population				
2008	Total population estimates	304,059,724	804,194	5,681
2000	Total population estimates	281,421,906	755,657	6,386
2008	Population Top Two Largest Cities	Colome-291, Winner-2,744		
2000	Population Top Two Largest Cities	Colome-340, Winner-3,137		

Source Data: U.S. Census 2008

Table 3.10-4 Winner Alternative Age and Gender Demographics

Year	Description	South Dakota	Tripp County
2008	Total population estimates	804,194	5,681
Age			
2006	Under 5 years	52,218	318
2006	5 to 13 years	90,502	718
2006	14 to 17 years	45,550	393
2006	18 to 24 years	86,114	530
2006	15 to 44 years	319,559	2,092
2006	45 to 64 years	192,194	1,587
2006	65 years and over	110,530	1,247
Sex			
2006	Male	385,620	2,964
2006	Female	390,313	3,101

Source Data: U.S. Census 2006

3.10.2 ECONOMIC RESOURCES

3.10.2.1 Crow Lake Alternative

Tables 3.10-5 and 3.10-6 provide a brief inventory of the economic resources within the Crow Lake Alternative. The median income for households in South Dakota increased between 2000 and 2005, as well as for each of the counties to be crossed by the Proposed Project. This increase ranged from 8 percent in Jerauld County to 21 percent in Aurora County.

The economy of Aurora, Brule and Jerauld counties is comprised of multiple sectors and industries. A significant portion of jobs (15.8 percent to 24 percent) come from agriculture, forestry, fishing and hunting industries. In 2007, the unemployment rate in Aurora County, at 4.3 percent, was the highest of the three counties.

Table 3.10-5 Crow Lake Alternative Income

Year	Description	South Dakota	Aurora County	Brule County	Jerauld County	Source Data
2000	Total population estimates	755,657	3,060	5,351	2,279	1
2000	Median income in 1999 (dollars) for households	35,282	29,783	32,370	30,690	4
2005	Median income in 2005 (dollars) for households	40,096	35,953	35,412	33,152	4
2000	Median income in 1999 (dollars) for families	43,237	37,227	37,361	36,076	4
2000	Per Capita Income (dollars)	17,562	13,887	14,874	16,856	4
2000	Median earnings in 1999 of full-time, year-round male workers (dollars)	29,677	25,786	26,698	24,583	4
2000	Median earnings in 1999 of full-time, year-round female workers (dollars)	21,520	21,250	20,094	17,500	4

*Source Data: 1 = U.S. Census 2008, 4 = U.S. Census 2009

Table 3.10-6 Crow Lake Alternative Labor Force, Unemployment and Education

Year	Description	South Dakota	Aurora County	Brule County	Jerauld County	Source Data*
2000	Total Population	754,844	3,058	5,364	2,295	4
Labor Force						
2000	Population 16 years old and over, male and female combined labor force	N/A	1,474	2,694	1,183	4
2009	Population 16 years old and over, male and female combined Labor force	N/A	1,540	2,890	1,570	4
2009	Number of actually employed	N/A	1,475	2,790	1,530	4
Unemployment						
2000	Population 16 years old and over, male and female combined unemployed	N/A	27	183	29	4
2009	Population 16 years old and over, male and female combined unemployed	N/A	65	100	40	4
2007	South Dakota Annual Average Unemployment Rates	N/A	3.1%	2.8%	2.7%	3
% Distribution by Occupation						
2000	Management, professional and related occupations	32.6	39.7	40.5	35.4	4
2000	Service Occupations	15.6	17.2	18.2	15.0	4
2000	Sales and Office Occupations	26.5	17.7	22.0	19.8	4
2000	Farming, fishing and forestry occupations	1.9	4.0	2.8	4.8	4
2000	Construction, extraction and maintenance occupations	9.1	7.7	9.0	10.0	4
2000	Production, transportation and material moving occupations	14.2	13.7	7.4	15.0	4
2000	% in Agriculture, forestry, fishing and hunting Industries	7.7	24%	15.8%	22.6	4
2000	% in Manufacturing Industry	11.1	6.1%	2.9%	9.7	4
2000	% Government Workers (local, State or Federal)	15.3	15.1%	14.2 %	10.2	4
Education (Persons 25 and older)						
2000	High School graduate or higher (%)	84.6	79.5	81.1	79.6	4
2000	Bachelor's Degree or higher (%)	21.5	12.7	20.6	12.3	4

*Source Data: 3 = SDDL 2009, 4 = U.S. Census 2009

3.10.2.2 Winner Alternative

Tables 3.10-7 and 3.10-8 provide a brief inventory of the economic resources within Tripp County. The median income for households in Tripp County increased by 14 percent between 2000 and 2005. The economy of Tripp County consists of multiple sectors and industries. A significant portion of jobs (23.3 percent) come from agriculture, forestry, fishing and hunting industries. In 2007, the unemployment rate in Tripp County was 3.6 percent.

Table 3.10-7 Winner Alternative Income

Year	Description	South Dakota	Tripp County	Source Data*
2000	Total population estimates	755,657	6,386	1
2000	Median income in 1999 (dollars) for households	35,383	28,333	4
2005	Median income in 2005 (dollars) for households	40,096	32,334	4
2000	Median income in 1999 (dollars) for families	43,237	36,219	4
2000	Per Capita Income (dollars)	17,562	13,776	4
2000	Median earnings in 1999 of full-time, year-round male workers (dollars)	29,677	22,588	4
2000	Median earnings in 1999 of full-time, year-round female workers (dollars)	21,520	18,070	2

*Source Data: 1 = U.S. Census 2008, 2 = U.S. Census 2006, 4 = U.S. Census 2009

Table 3.10-8 Winner Alternative Labor Force, Unemployment and Education

Year	Description	South Dakota	Tripp County	Source Data*
2000	Total Population	754,844	6,430	4
Labor Force / Unemployment				
2000	Population 16 years old and over, male and female combined labor force	N/A	4,861	4
2009	Population 16 years old and over, male and female combined Labor force	N/A	2,995	4
2009	Number of actually employed	N/A	2,890	4
Unemployment				
2000	Population 16 years old and over, male and female combined unemployed	N/A	133	4
2007	South Dakota Annual Average Unemployment Rates	N/A	3.1%	3
Employment Industry				
2000	Management, professional and related occupations	32.6	39.5	4
2000	Service Occupations	15.6	14.1	4
2000	Sales and Office Occupations	26.5	22.5	4
2000	Farming, fishing and forestry occupations	1.9	5.7	4
2000	Construction, extraction and maintenance occupations	9.1	8.9	4
2000	Production, transportation and material moving occupations	14.2	9.3	4
2000	% in Agriculture, forestry, fishing and hunting Industries	7.7	23.3	4
2000	% in Manufacturing Industry	11.1	1.1	4
2000	% Government Workers (local, State or Federal)	15.3	14.8	4
Education (Persons 25 and older)				
2000	High School graduate or higher (%)	84.6	80.2	4
2000	Bachelor’s Degree or higher (percent)	21.5	13.5	4

*Source Data: 1 = U.S. Census 2008, 3 = SDDL 2009, 4 = U.S. Census 2009

3.11 ENVIRONMENTAL JUSTICE

Executive Order 12898*, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, states that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations."

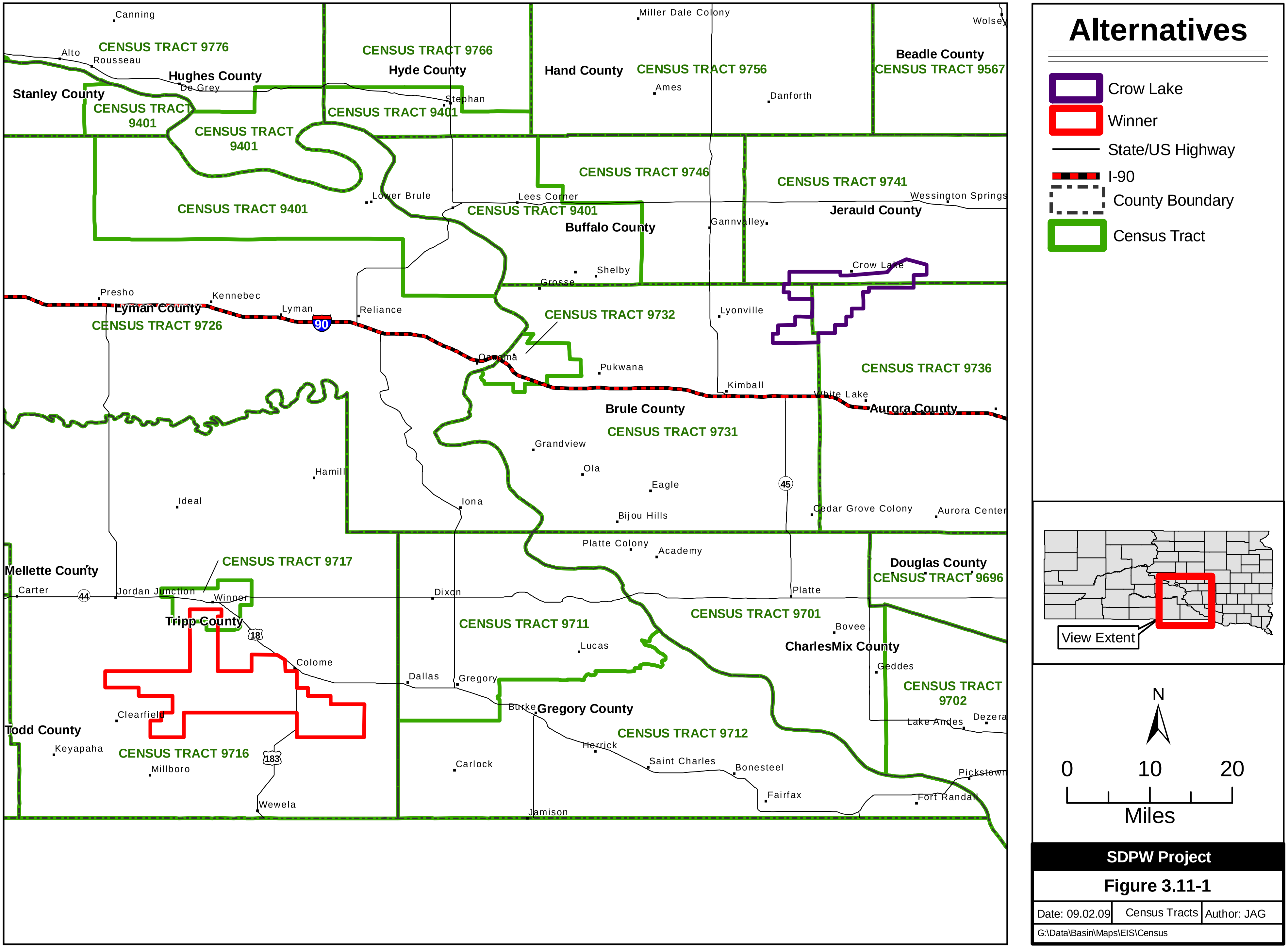
This section identifies existing minority populations, low-income populations and tribal communities, defined as follows:

Minority: Individual(s) who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic.

Minority population: Minority populations are either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. In identifying minority communities, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a geographically dispersed/transient set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect. The selection of the appropriate unit of geographic analysis may be a governing body's jurisdiction, a neighborhood, census tract or other similar unit that is to be chosen so as to not artificially dilute or inflate the affected minority population. A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds.

Low-income population: Low-income populations in an affected area are populations with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports on Income and Poverty. In identifying low-income populations, agencies may use the same criteria used to define a community for minority populations.

The ROI for environmental justice was identified based on census tracts. When first delineated, census tracts were designed to be homogeneous with respect to population characteristics, economic status and living conditions. Census tracts are relatively permanent statistical subdivisions of a county; usually have between 2,500 and 8,000 persons; and are intended to be maintained over a long time so that statistical comparisons can be made from census to census (Census Bureau 2009). The ROI for the Crow Lake Alternative includes the following census tracts: 9731, 9736 and 9746. The ROI for the Winner Alternative includes the following census tracts: 9716 and 9717. Data from the U.S. Census Bureau (U.S. Census 2000a and 200b) was obtained for the identified census tracts to characterize the minority and low income population occupying the ROI near the Proposed Project alternatives, depicted in **Figure 3.11-1**.



SDPW Project

Figure 3.11-1

Date: 09.02.09 | Census Tracts | Author: JAG

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3.11.1 MINORITY AND LOW-INCOME POPULATIONS

3.11.1.1 Crow Lake Alternative

Generally, the composition of race in South Dakota is predominantly White, less than 10 percent American Indian and Alaskan Native, and a very small percentage of other races. Within the three counties being considered, nearly all the population is white, with near equal gender representations in the predominantly agricultural region. **Tables 3.10-1, 3.10-2 and 3.10-3** in the prior section show the population and individual and demographics including age and sex for South Dakota, Aurora, Brule and Jerauld counties. As identified in **Table 3.11-1**, approximately 99 percent of the population is White within the area of the Crow Lake Alternative. Although there is not a large American Indian population within the area, there are several tribes with historic ties to the area. The Crow Lake Alternative is located approximately 12.5 miles east of the Crow Creek Reservation.

Table 3.11-2 depicts the poverty levels recorded in the census tracts encompassing the Crow Lake Alternative area. Overall for South Dakota, 13.2 percent of the individuals for whom the poverty status is determined are considered below poverty levels. The percentages of poverty levels in the census tracts crossing the site are lower in Aurora County (associated with census tract 9736), and slightly higher in Brule and Jerauld counties (associated with census tracts 9731 and 9741, respectively).

Table 3.11-1 Crow Lake Alternative Race Demographics

Race	South Dakota		Census Tract 9736 Aurora County		Census Tract 9731 Brule County		Census Tract 9741 Jerauld County	
	Population	Percent	Population	Percent	Population	Percent	Population	Percent
White	669,404	88.7%	2,926	95.7%	2,591	99.6%	2,272	99.0%
Black or African American	4,685	0.6%	9	0.3%	0	0%	0	0%
American Indian and Alaskan Native	62,283	8.3%	59	1.9%	32	1.2%	13	0.6%
Asian	4,378	0.6%	3	0.1%	17	0.6%	3	0.1%
Native Hawaiian and Other Pacific Islander	261	0%	0	0%	0	0%	0	0%
Some other race	3,677	0.5%	44	1.4%	0	0%	0	0%
Two or more races	10,156	1.3%	17	0.6%	10	0.4%	7	0.3%

Source: U.S. Census 2009

Table 3.11-2 Crow Lake Alternative Poverty Levels

	South Dakota	Census Tract 9736 Aurora County	Census Tract 9731 Brule County	Census Tract 9741 Jerauld County
All individuals for whom poverty status is determined	727,425	2,858	2,650	2,250
Number below poverty level	95,900	327	416	464
Percent below poverty level	13.2%	11.4%	15.7%	20.6%

Source Data: U.S. Census 2000b

3.11.1.2 Winner Alternative

In general, the Proposed Project area is located in a predominantly White, predominantly agricultural region. **Tables 3.10-4, 3.10-5 and 3.10-6** in the prior section show the population and individual and demographics including age, sex and race for South Dakota and Tripp County. As identified in **Table 3.11-3**, approximately 84 percent of the population is White and approximately 15 percent of the population is American Indian and Alaskan Native within the area of the Winner Alternative. The Winner Alternative is located 8.6 miles east of the Rosebud Reservation.

Table 3.11-4 depicts the poverty levels recorded in the census tracts encompassing the Winner Alternative area. Overall for South Dakota, 13.2 percent of the individuals for whom the poverty status is determined are considered below poverty levels, comparatively, the percentages of poverty levels in the census tracts crossing the site are higher.

3.12 HUMAN HEALTH AND SAFETY

Existing conditions related to air quality, water quality and noise are discussed in their respective resource sections in this chapter. Aviation is discussed in the transportation section. The following information presents the baseline for which impacts to human health and safety were analyzed. The Proposed Project alternatives are located in rural, agricultural areas with low population densities. The predominant activities are farm and range related. Access to private land is restricted by landowners. Public safety is provided by local law enforcement or emergency response agencies. Fire services for the Proposed Project areas are provided by county volunteer fire departments.

While potentially hazardous materials may be associated with areas used for agricultural activities (petroleum products used in farm equipment, pesticides, herbicides and isolated dump sites), a site inspection found nothing to indicate that there were pre-existing hazardous or environmental conditions in areas proposed for development (Terracon 2009a and 2009b).

Table 3.11-3 Winner Alternative Race Demographics

Race	South Dakota		Census Tract 9716 Tripp County		Census Tract 9717 Tripp County	
	Population	Percent	Population	Percent	Population	Percent
White	669,404	88.7%	2,492	92.6%	3,133	83.8%
Black or African American	4,685	0.6%	0	0%	2	0.1%
American Indian and Alaskan Native	62,283	8.3%	165	6.1%	555	14.8%
Asian	4,378	0.6%	2	0.1%	2	0.1%
Native Hawaiian and Other Pacific Islander	261	0%	0	0%	0	0%
Some other race	3,677	0.5%	2	0.1%	3	0.1%
Two or more races	10,156	1.3%	30	1.1%	44	1.2%

Source: U.S. Census 2009

Table 3.11-4 Winner Alternative Poverty Levels

	South Dakota	Census Tract 9716	Census Tract 9717
All individuals for whom poverty status is determined	727,425	2,670	3,624
Number below poverty level	95,900	553	701
Percent below poverty level	13.2%	20.7%	19.3%

Source Data: U.S. Census 2000b

4 Environmental Consequences

This chapter identifies the potential environmental consequences of implementing the Proposed Project and the proposed Federal actions (Western's proposed action is to consider whether to allow an interconnection request; RUS's proposed action is to consider whether to provide financial assistance). The EIS addresses the requirements of applicable laws and regulations including the requirements of NEPA, Section 102(2), the CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), DOE NEPA Implementing Procedures (10 CFR Part 1021), RUS Environmental Policies and Procedures (7 CFR Part 1794), and the following statutes and Executive Orders:

- Agriculture Department Regulation (DR) 5600-2, Environmental Justice
- Agriculture DR 9500-3, Land Use Policy
- Agriculture DR 9500-4, Fish and Wildlife Policy
- Bald and Golden Eagle Protection Act
- USDA, Departmental Policy for the Enhancement, Protection and Management of the Cultural Environment
- Archeological Resources Protection Act
- Clean Air Act
- Clean Water Act
- Endangered Species Act
- Farmland Protection Policy Act
- Migratory Bird Treaty Act
- National Historic Preservation Act
- Native American Graves Protection and Repatriation Act
- Noxious Weed Act
- Presidential Executive Order 11988 (Floodplain Management)
- Presidential Executive Order 11990 (Wetlands Management)
- Presidential Executive Order 12088 (Federal Compliance With Pollution Control)
- Presidential Executive Order 12898 (Environmental Justice)
- Presidential Executive Order 13007 (Indian Sacred Sites)
- Presidential Executive Order 13112 (Invasive Weed Species)
- Presidential Executive Order 13186 (Environmental Stewardship / Transportation / Infrastructure)
- Presidential Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks)
- Safe Drinking Water Act
- Wild and Scenic Rivers Act

As described in **Chapter 3**, the affected environment or ROI is the physical area that bounds the environmental, sociological, economic, or cultural feature of interest that could be impacted by implementing the Proposed Project and the proposed Federal actions. The boundaries of the ROI may vary depending on the resource being analyzed.

Direct and indirect impacts for each of the alternatives are identified for each resource component. Direct effects are "caused by the action and occur at the same time and place." Indirect effects are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR 1508.8).

Construction, operation and decommissioning of the Proposed Project and Western's system modifications at its existing substation were analyzed to determine potential impacts for each alternative. As identified in **Chapter 2**, the "Proposed Project Components" include:

- Wind Turbine Generators and Foundations
- O&M Building
- Underground Communication System and Electrical Collector Lines
- Collector Substation and Microwave Tower
- Overhead Transmission Line
- Temporary Equipment/Material Storage or Lay-down Areas
- Crane Walks
- New and/or Upgraded Service Roads to Access the Facilities

The significance criteria used for determining potential impacts for each environmental and socioeconomic resource were developed based on scientific information, statute, or in response to public concern. Criteria were only developed for potential impacts identified as issues during the EIS scoping process. For issues not identified during the EIS scoping process, potential impacts are addressed as described in the impact assessment sections for each resource. "Thresholds of significance" were used to determine the level of environmental impact for issues identified during the EIS scoping process. These thresholds of significance establish benchmarks for increasing levels of effects, the highest of which is significant impact. Significance can be viewed in two ways: 1) the effect is environmentally significant; and/or 2) the effect has policy significance. Thresholds of significance were determined by evaluating the expected impacts against the significance criteria for each of the alternatives.

The Applicants and Agencies have included BMPs and APMs for the Proposed Project and proposed Federal actions to minimize impacts associated with construction; these practices are described in **Chapter 2, Table 2.2** and **Table 2.3,** by resource area, as applicable. The Applicants and Agencies have committed to these included BMPs and APMs prior to the evaluation of environmental impacts. If impacts are determined to be less than significant after application of the included BMPs and APMs, then no additional mitigation is proposed. However, for significant impacts that would remain after these BMPs and APMs are applied, additional mitigation (resulting from additional analyses or public/agency review and comment) would be included in the FEIS.

The impact analysis was conducted by evaluating potential impacts with BMPs and APMs in place, then weighing any residual impacts against the significance criteria and identifying additional mitigation measures, if necessary. The following thresholds of significance used for this analysis are listed in order of increasing level of impact:

- No Impact
- Less than Significant Impact
- Potentially Significant Impact with Proposed Mitigation

4.1 GEOLOGY AND SOILS

4.1.1 METHODS

The ROI for geology and soils includes areas of immediate disturbance associated with development of the Proposed Project Components and proposed Federal actions. As presented in **Section 3.1**, geologic data has been obtained from the South Dakota Geological Survey (SDGS). Reports prepared for local exploration and expansion of community water supplies provided additional information. Geologic units and physiographic provinces have been cross-checked against GIS data and maps obtained from the USGS and EPA (USGS 2009). Soil characteristics have been obtained from the NRCS database (NRCS 2009). Data obtained from the combination of these sources have been overlain on a GIS map of the Proposed Project Components in order to assess impacts.

4.1.2 SIGNIFICANCE CRITERIA

The principal measure of effect on soil resources is the amount and location of soils disturbed during construction and occupied during operations.

A significant impact to geology and soils would occur if:

- The Proposed Project and/or the proposed Federal actions would result in erosion, causing long-term impacts to other resources (*e.g.*, water quality)

4.1.3 IMPACT ASSESSMENT

For both alternatives, staging and construction activities would require sand and gravel resources. Sand and gravel resources are not available within the site boundaries, but are located in the vicinity. South Dakota’s annual production of sand and gravel is approximately 8,000,000 tons per year (Peterson Hammond 1992). For the Proposed Project, each turbine base would use approximately 320 cubic yards of concrete, encompassing approximately 33,000 cubic yards total, and would require approximately 46,200 tons of sand and gravel. This amount is less than half of one percent of the sand and gravel annually generated within South Dakota. There could also be potential for additional gravel to be used for road improvements. Use of these resources for the construction activities would not deplete the availability and supply of sand and gravel.

4.1.3.1 Crow Lake Alternative

Development of the Crow Lake Alternative would result in approximately 1,405 acres of temporary disturbance and approximately 133 acres of permanent impacts to soils. These potential impact estimates would be applicable regardless of which transmission line option would be selected.

Soils in the Proposed Project area are considered by NRCS to have a slight to moderate risk of erosion. During construction, existing vegetation would be removed in the areas associated with the Proposed Project Components, potentially increasing the risk of erosion. Once vegetation is removed in the vicinity of the construction areas, soils would be excavated to achieve necessary grades and put into stockpiles. Excavations would likely encounter the Quaternary sediments consisting of nonglacial alluvium, glacial deposits, loess, and colluvium, and near-surface or surface outcrops of Pierre Shale. Included BMPs and APMs (as listed in **Chapter 2, Table 2.2** and **Table 2.3**) and a SWPPP would be implemented for the construction, operation and decommissioning activities for the Proposed Project Components.

Further, geotechnical investigations would identify the stability of the soils and underlying geology to assist with turbine placement, design of foundations and specification of drainage controls. Grading would be designed to manage runoff and achieve long-term stabilization of restored temporary disturbance areas and areas with permanent installations. Foundation designs would consider compaction requirements for backfill, depth to the saturated zone, slope erosion potential and similar factors.

For the aforementioned reasons, implementing the Proposed Project would result in minimal erosion and would not cause long-term impacts to geology, soils, or water resources (see **Section 4.2**); thus, the impacts would be less than significant.

If the Proposed Project is approved, development of the Western system modifications at the Wessington Springs Substation would result in less than significant impacts to geologic and soil resources since work would be short-term in duration and confined to a previously disturbed and graded area. Development of the Western system modifications at the Wessington Springs Substation would employ the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), and would adhere to a SWPPP.

4.1.3.2 Winner Alternative

Development of the Winner Alternative would result in approximately 3,188 acres of temporary disturbance and approximately 261 acres of permanent impacts to soils. In general, the impacts associated with the Winner Alternative would be similar to those identified for the Crow Lake Alternative.

Soils in the Proposed Project area are considered by NRCS to have a slight risk of erosion. As described for the Crow Lake Alternative, included BMPs and APMs (as listed in **Chapter 2, Table 2.2** and **Table 2.3**) and a SWPPP would be implemented. Geotechnical investigations would identify the stability of the soils and underlying geology to assist with turbine placement, design of foundations and specification of drainage controls. Development of the Proposed Project would result in less than significant impacts to geology, soils or water resources (see **Section 4.2**).

With the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), and adherence to a SWPPP, Western's system modifications proposed for the Winner Substation would result in less than significant impacts, similar to the Wessington Springs Substation proposed for the Crow Lake Alternative.

4.1.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. There would be no geology and soils impacts associated with the No Action Alternative.

4.2 WATER RESOURCES

4.2.1 METHODS

The ROI for water resources encompasses those hydrologic systems that could be impacted by discharges, spills and/or stormwater runoff associated with implementing the Proposed Project and proposed Federal actions. The water resources assessment includes consideration of the compilations of technical memorandums for both alternatives (Terracon 2009a and 2009b). Surface water flows, impaired waters, floodplains, groundwater resources and wetlands data have been cross-checked against data and reports from the DENR, USGS and GIS maps from the EPA, USFWS and USGS. Potential impacts have been identified based on the available resource information, consideration of the elements for evaluation, and in relation to the impact analysis area.

4.2.2 SIGNIFICANCE CRITERIA

A significant impact to water resources would occur if:

- The normal flow of a water body or normal drainage patterns and runoff would be substantially altered; or if the Proposed Project Components would be placed within a 100-year flood hazard area that would impede or redirect flood flows

- The quantity and quality of discharges within waters or watercourses would be modified by in-stream construction or accidental contamination to the extent that water use by established users is measurably reduced, or the water quality of already impaired waters is further degraded
- An activity would cause an increase in susceptibility to on-site or off-site flooding due to altered surface drainage patterns or stream channel morphology, per Presidential Executive Order 11988 Floodplain Management
- Surface drainage patterns or stream channel morphology would be altered to the extent that vegetation communities and habitats dependant on current hydrologic conditions are degraded
- An activity would cause a loss or degradation of wetlands (including WUS) in violation of the terms and conditions of a USACE permit

4.2.3 IMPACT ASSESSMENT

Wetlands (including jurisdictional WUS, collectively termed "wetlands") have not been delineated for the Proposed Project alternatives. Based on guidance from the agencies in coordination with the Applicants, additional resource surveys and engineering siting would occur that may adjust the locations of turbines indicated herein. Water resource factors which may affect the locations of individual turbines include, but are not limited to, a wetland delineation and other resource and engineering considerations. Under the included BMPs and APMs, further coordination would occur between the Applicants and the USACE to avoid and minimize potential impacts to wetlands. As necessary, the Applicants would obtain the necessary permit(s) under Section 404 of the CWA prior to construction; permits may not be acquired before the completion of the EIS. Potential permanent impacts to wetlands would be less than significant, in accordance with USACE requirements for each of the alternatives.

4.2.3.1 Crow Lake Alternative

The majority of both temporary and permanent disturbances would be on land currently used for rangeland and agriculture and on soils with low representative slopes. However, the excavation and exposure of soil during construction of the Proposed Project Components could cause sediment runoff during rain events. Alteration of flow patterns is not anticipated and would be avoided wherever possible. Potential impacts in these areas that result from construction, operation and decommissioning activities would be minimized through implementing and adhering to regulations and permits governing storm water pollution prevention and sediment control, such as a General Construction Storm Water Permit, SWPPP, 404 permit, and FEMA and county regulations. The SWPPP would outline BMPs for construction, operation and decommissioning of the site to protect water resources (including downstream impaired waters) and adjacent wetlands and minimize the potential for soil erosion and sediment transport. Implementation of the included BMPs and APMs (as listed in **Chapter 2, Table 2.2 and Table 2.3**) and permits would ensure that potential impacts to surface water flows, drainage patterns, quantity and quality are less than significant during construction, operation and decommissioning activities.

On-site or off-site flooding would not result from construction, operation or decommissioning of the Proposed Project. Flood hazard zones have not been identified in the Crow Lake Alternative; as needed, the final engineering design would evaluate site conditions and the BMPs and APMs would be implemented to address potential flooding. Thus, development of the Proposed Project would result in less than significant impacts to floodplains.

Additionally, excavations for foundation installations may have the potential to encounter shallow groundwater resources. If shallow groundwater is encountered during construction or decommissioning, the Applicants would obtain a Dewatering Permit from DENR. Water extraction during potential dewatering operations would be conducted in a manner to protect water quality, and would be of minimal volume. Potential effects on groundwater would be isolated and small-scale, resulting in short-term, localized water table depressions that would not remain following construction or decommissioning. Thus, development of the Proposed Project would result in less than significant impacts to water supplies.

Development of the Crow Lake Alternative would result in approximately 4 acres of temporary impact and zero acres of permanent impacts to field-identified wetlands. These potential impact estimates would be applicable regardless of which transmission line option would be selected. Wetlands within USFWS easements on private property are under USFWS jurisdiction. As included in the BMPs and APMs, the Applicants would site the Proposed Project Components to avoid wetlands and if wetlands cannot be avoided, the Applicants would work with the USFWS and/or USACE to obtain permits and minimize impacts to wetlands. Therefore, impacts to wetlands would be less than significant.

If the Proposed Project is approved, development of the Western system modifications at the Wessington Springs Substation would not result in any impacts to water resources since drainage from the site is controlled by the site’s SWPPP. Based on construction of the existing substation, groundwater is not expected to be encountered during foundation excavation activities. If groundwater is encountered, Western would address this in accordance with BMPs, APMs (**Chapter 2, Tables 2.2** and **2.3**), and other regulatory requirements.

4.2.3.2 Winner Alternative

The impacts associated with the Winner Alternative would be similar to those for the Crow Lake Alternative. However, development of the Winner Alternative would result in approximately 16 acres of temporary impact and approximately 1.8 acres of permanent impacts to field-identified wetlands. These potential impact estimates would be applicable regardless of the transmission line option selected. Wetlands within USFWS easements on private property are under USFWS jurisdiction. Potential impacts to wetlands would be avoided. If wetlands would be impacted, the Applicants’ would work with the USFWS and USACE to obtain permits and minimize unavoidable impacts; therefore, impacts to wetlands would be less than significant.

If the Proposed Project is approved, Western's system modifications at Winner Substation would result in impacts similar to the Wessington Springs Substation. Development of the Western system modifications would employ the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**).

4.2.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. There would be no water resource impacts associated with the No Action Alternative.

4.3 CLIMATE CHANGE AND AIR QUALITY

4.3.1 METHODS

The ROI for climate change and air quality includes areas of immediate disturbance associated with the Proposed Project and the proposed Federal actions, in association with the regional conditions. This analysis evaluates environmental impacts to air resources as a result of the construction, operation and decommissioning of the Proposed Project and the proposed Federal actions. DENR data have been researched to verify current State regulations regarding the guideline levels for criteria pollutants. In addition, South Dakota's Ambient Air Quality Standards (SDAAQS) have been identified under the SDCL, Chapter 34A-1. This public policy of the State serves to achieve and maintain reasonable levels of air quality as well as support local and regional air pollution control programs. Climate data has been obtained from the Chamberlain, South Dakota weather station. GHG and climate change information has been obtained from the interactive Green Power Equivalency Calculator available from the EPA for purposes of broader analysis and climate change analysis (EPA 2009a), see **Chapter 5 Section 5.4.1** for additional discussion).

4.3.2 SIGNIFICANCE CRITERIA

A significant impact to air quality would occur if:

- An activity would result in violation to any local, State, or Federal air quality standard due to increased fugitive dust emissions

4.3.3 IMPACT ASSESSMENT

4.3.3.1 Crow Lake Alternative

The Crow Lake Alternative is not in a non-attainment area for any criteria pollutant under any applicable air quality standard. Fugitive dust emissions from the Proposed Project would be within standards set forth by DENR and NAAQS. Increased fugitive dust emissions would be temporary and minor during construction or decommissioning of the Proposed Project Components, and would not exceed SDAAQS particulate standards.

Further, operation of the Proposed Project would offset emission sources when compared to similarly-sized electric generating facilities using carbon-based fuel sources. Wind-generating stations do not emit CO_2 (which is a GHG that contributes to climate change); it is estimated that the Proposed Project would avoid 726,600 metric tons of CO_2 emissions per year (EPA 2009b) compared to the average emissions of fossil fueled generating stations employed in South Dakota. This amount avoided is equal to the annual carbon dioxide emissions of approximately 130,000 average passenger cars (EPA 2009b). The greatest advantage of wind power is electricity generation without air emissions, including CO_2. Some emissions would be generated from construction and maintenance activities, primarily from vehicle exhaust.

Impacts would be restricted to short periods during construction or decommissioning at small, individual sites. Included BMPs and APMs (as listed in **Chapter 2, Table 2.2 and Table 2.3**) would be employed during ground disturbing activities. Therefore, development of the Proposed Project would not result in a violation to any local, State, or Federal air quality standard and therefore would result in less than significant impacts.

Western's Wessington Springs Substation currently has SF_6 gas-filled circuit breakers, and Western would install additional SF_6 breakers to interconnect the Proposed Project. During operation of the new substation additions, authorized Western personnel would conduct periodic inspections and service equipment as needed. Properly trained maintenance personnel would monitor and manage the use, storage and replacement of SF_6 to minimize any releases to the environment. SF_6 gas used in substation circuit breakers is contained in sealed units that are factory-certified not to leak. During inspections, equipment would be monitored for detection of leaks, and repairs would be made as appropriate. If the Proposed Project is approved, Western's system modifications at Wessington Springs Substation would incorporate BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**); therefore, impacts to air quality from fugitive dust would be less than significant.

4.3.3.2 Winner Alternative

Impacts of the Winner Alternative would be similar to those identified for the Crow Lake Alternative; therefore, impacts to air quality would be less than significant.

SF_6 breakers would be installed at the Winner Substation to accommodate the interconnection, and the same practices proposed for Wessington Springs would be employed at Winner Substation. If the Proposed Project is approved, Western's system modifications at Winner Substation would incorporate BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**); therefore, impacts to air quality from fugitive dust would be less than significant.

4.3.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. There would be no climate change and air quality impacts associated with the No Action Alternative.

4.4 BIOLOGICAL RESOURCES

4.4.1 METHODS

The impact assessment for biological resources was conducted by evaluating impacts to vegetation communities, suitable or occupied habitats and/or known species occurrences within the Crow Lake and Winner Alternatives. If suitable or occupied habitats would be impacted by development of either alternative, the level of impact was determined and significance criteria (described in **Section 4.4.2**) were applied to each community, habitat or species.

4.4.2 SIGNIFICANCE CRITERIA

Significance criteria for biological resources are different for vegetation, common wildlife and special-status species. These criteria are used to disclose whether biological resources would be impacted by the Proposed Project to assist the Agencies with their final determinations.

<u>Vegetation</u>

A significant impact to vegetation resources would occur if:

1. An activity resulted in the long-term loss of riparian vegetation
2. An activity resulted in uncontrolled expansion of noxious weeds (Presidential Executive Order 13112 – Invasive Weed Species)

<u>Wildlife</u>

A significant impact to wildlife resources would occur if:

1. An activity affected the biological viability of a local, regional or national population of wildlife species
2. An activity violated Federal or State wildlife conservation policy. For birds not Federally-listed, the applicable policy is the MBTA or BGEPA

Special Status Species: Endangered, Threatened, Proposed, Candidate and Other Sensitive Species

A significant impact to endangered, threatened, proposed, candidate and other sensitive species would occur if:

1. An activity affected the biological viability of a local, regional or national population of a State-listed wildlife species or one of concern/interest resulting in the increase in severity of listing status (*e.g.*, from threatened to endangered)(SDCL 34A-8)
2. An activity violated the SDCL 34A-8, which protects State-listed species
3. An activity resulted in take of a protected species beyond that authorized by permit (SDCL 34A-8)
4. An activity violated the MBTA or BGEPA

A BA is being prepared under Section 7 of the ESA for Federally-listed species. Findings of the BA will be summarized in the FEIS. While SDCL 34A-8 does not require agency consultation for State-listed threatened and endangered species, SDGFP has been active in the preparation of this DEIS.

4.4.3 IMPACT ASSESSMENT

4.4.3.1 Crow Lake Alternative

Vegetation

Construction of the Proposed Project would result in temporary and permanent impacts to existing vegetation within the Crow Lake Alternative. The majority of these impacts would be in the mixed-grass prairie and cropland vegetation communities. Any damage to field crops on cultivated lands during construction would be compensated by the Applicants. Within non-cultivated lands, mixed-grass prairie (mostly rangeland and pasture) and wetlands are the vegetation communities most sensitive to disturbance. Areas of direct and indirect impacts within each vegetation class are based on vegetation community mapping for the Proposed Project (Tierra EC 2009), as presented in **Table 4.4-1**.

The Proposed Project would result in the temporary disturbance of approximately 1,009 acres of mixed-grass prairie, 391 acres of cropland, 4.0 acres of wetlands and 1.0 acre of shelterbelts. The Proposed Project would result in the permanent disturbance of approximately 97 acres of mixed-grass prairie, 36 acres of cropland and 0.6 acres of shelterbelts. Mixed-grass prairie is principally rangeland and pasture. Impacts that would occur to cultivated lands are not considered biologically significant because these lands are frequently disturbed by tilling, planting and harvesting activities associated with crop production.

The Crow Lake Alternative would permanently remove approximately 97 acres of mixed-grass prairie. These losses would be widely dispersed across the Crow Lake Alternative which has approximately 23,007 acres of mixed-grass prairie, amounting to a very small percentage of the total area (0.4 percent). Access roads would increase fragmentation of native rangeland, in some cases resulting in smaller patches of the remaining grassland types (**Figure 3.4-1**).

The Crow Lake Alternative would result in the temporary disturbance of 82 acres and the permanent disturbance of 11 acres within USFWS grassland easements. It would also result in the temporary disturbance of 140 acres and the permanent disturbance of 9 acres within USFWS wetland easements. These acreages are included within, not in addition to, the total areas cited in the previous paragraph. As currently proposed, location of turbines in grassland easements would comply with the permit conditions for those easements. Within areas proposed for easements, turbines would be placed at low densities so as not to substantially alter habitat quality.

Table 4.4-1 Summary of Disturbance Areas within Vegetation Communities in the Crow Lake Alternative

Vegetation Type	Total Temporary Disturbance (acres)	Total Permanent Disturbance (acres)
Mixed-grass prairie	1,009	97
Cropland	391	36
Wetlands	4.0	0
Farmstead	0.11	0.04
Shelterbelt	1.0	0.6
Deciduous forest	0	0
Total area	1,405	133

Note: Discrepancies may exist in total values due to rounding.

Permanent vegetation loss would result from removal of vegetation at turbines, collector and interconnection substations, the O&M building, underground and overhead collection lines and access roads. Temporary disturbance would result from turbine work areas, crane walks, temporary lay down areas, the underground and overhead collection system and areas along the access roads. Permanent loss of vegetation would be minimized by limiting the area of physical ground disturbance through the use of existing roads and by reseeding all temporarily disturbed areas with native mixtures of grasses upon completion of construction activities. Impacts in these areas that occur as a result of construction, operation and decommissioning activities would not substantially increase disturbance levels compared with existing, non-project-related disturbances such as roads and agriculture. Impacts to temporarily disturbed rangeland and pasture would be short-term, and the disturbed areas would revegetate quickly after re-seeding.

Physical ground disturbance and construction vehicles, and possibly increased public access, could facilitate the establishment and spread of noxious weeds. Noxious weeds compromise native biodiversity and create financial burdens. South Dakota has 27 documented noxious weed species, 11 of which occur in Aurora, Brule and Jerauld counties (see **Table 3.4-2**). The establishment of noxious/invasive vegetation could be limited by early detection and eradication. State law requires that listed weeds be controlled by the landowner, and the Applicants would comply with local and State requirements for noxious weed control during construction of the Proposed Project.

To prevent the possible introduction of noxious weed seed, heavy equipment from other geographic regions used during construction would be washed prior to departure from the equipment storage facility. Washing equipment prior to transport from one work site to another is not recommended. On-site equipment washing increases the chance of weed seed dispersal by drainage of water off the site, across an area greater than the size of the work site. Instead, accumulations of mud would be “knocked off”. This method promotes containment of weed seeds on the work site.

Follow-up monitoring of the presence, distribution and density of noxious weeds would be conducted for three years post-construction to ensure the success of control measures. Surveys would be conducted as early in the year as feasible to control noxious weeds before they produce seed. Control methods would be based on the available technology and the weed species present. Methods used to control weeds may include mowing or handpulling; in extreme cases of noxious weed infestation, an approved herbicide may be applied.

Fugitive dust generated during clearing, grading and vehicle travel could adversely affect vegetation, but any effects would be short-term and localized to the immediate area of construction. Control measures would be implemented to minimize fugitive dust emissions from construction-related traffic and ground disturbance (see **Chapter 2, Tables 2.2 and 2.3**). Access road construction could result in increased public access depending on the amount of access permitted by the landowners. If public access is increased, there could be an increase in wildfires ignited by catalytic converters and careless cigarette use. The risk for wildfires would be greatest in summer and autumn when native grasses have gone dormant and fuel loads are at their peak. To limit new or improved access into the area, all new access roads not required for maintenance would be closed. Due to the private ownership of the leased lands, the majority of roads would be gated, further limiting public access and thus minimizing noxious weed spread and wildfire ignition.

These impacts would not affect the biological viability of any local, regional or national plant species. Because the footprint of the Proposed Project is relatively small compared with the overall size of the Crow Lake Alternative, and much of the area is tilled annually for agricultural production, direct impacts to vegetation would be minimal.

As included in the Proposed Project BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), the Applicants would locate the Proposed Project Components to avoid wetlands; if wetlands cannot be avoided, the Applicants would work with the USFWS and/or USACE to obtain permits and minimize impacts. Therefore, impacts to wetlands would be less than significant. The Applicants have committed to complying with USACE mitigation requirements.

Based on the minimal impacts to vegetation resources described above, impacts to Vegetation Significance Criteria 1 and 2 (**Section 4.4.2**) would be met, and impacts to vegetation resources due to construction, operation and decommissioning of the Proposed Project would be less than significant.

Wildlife

Mammals (excluding bats)

Most impacts to mammal species would be temporary and associated with the construction phases. Development of the Proposed Project would temporarily and permanently remove habitat. The Crow Lake Alternative would result in the temporary disturbance of 1,405 acres of habitat, while 133 acres would become permanently unavailable. The areas of temporary disturbance would be reclaimed and reseeded with an approved native seed mix. It would likely take two growing seasons before these areas would be restored to the pre-construction condition. The area of habitat permanently lost represents a relatively small amount of habitat available regionally (less than 1 percent), and the overall habitat quality has been reduced by grazing and agricultural practices. This small loss (less than 0.4 percent) of moderate quality habitat (grasslands are currently grazed) would not disrupt breeding, rearing or wintering behavior and would not influence the viability of local populations.

Noise, excavation and other forms of disturbance during construction would likely temporarily displace wildlife species within or adjacent to the disturbed areas. Upon completion of construction, wildlife species would become accustomed to operation and maintenance activities and would be expected to resume use of the Crow Lake Alternative. Permanent vegetation loss could destroy small mammal habitat, but population level effects would be negligible because less than 0.4 percent of the area would be permanently disturbed.

The risk for direct mortality of species resulting from construction activities or vehicle collision is limited. Adults are typically mobile and would be able to avoid construction equipment or vehicles (unless they were traveling at high rates of speed).

Based on the minimal impacts to mammals described above, Wildlife Significance Criteria 1 and 2 (**Section 4.4.2**) would not be exceeded, and impacts to mammals would be less than significant.

Bats

Construction of the Proposed Project could affect bats through direct mortality, habitat loss and fragmentation and disturbance effects (SDBWG and SDGFP 2009). Bat surveys for the Crow Lake Alternative are ongoing. There are no known roosts within or adjacent to the area. The probability of construction-related bat mortality is extremely low given their mobility and the absence of any roosts. Habitat loss and fragmentation effects to bats are also expected to be minimal. The permanent loss of approximately 97 acres of mixed-grass prairie foraging habitat would not represent an adverse effect to bats given the large adjacent tracts of similar habitat. No shrub or forested riparian habitats or other areas of concentrated bat use would be affected. A total of 0.6 acres of shelterbelt representing less than 0.2 percent of potential daytime roosting habitat may be permanently removed. Construction would generally occur during daylight hours and would not disturb these nocturnal animals.

Operation and maintenance impacts to bats include disturbance and displacement, habitat fragmentation and direct mortality. As noted above, general disturbance and displacement effects would be minimal given the small percentage of potential daytime roost tree removal within or adjacent to the Crow Lake Alternative. Maintenance activities would be conducted during daylight hours when bats are not active, and noise and movement associated with operating turbines are not likely to affect bats. Wind turbines and access roads could fragment foraging habitat for bats.

Collision-related bat mortality has been documented at most wind farms in the western U.S. (Erickson *et al.* 2002). Annual bat mortality rates have ranged between 0.74 and 2.3 fatalities per turbine at wind farms in Wyoming, Oregon and Minnesota (Young *et al.* 2003). Researchers have concluded that observed mortality rates do not have population-level effects, and no significant difference has been noted in mortality rates at lit and unlit turbines (Johnson *et al.* 2003). However, bat populations in the northeastern United States have been experiencing recent declines due to a fungus (white-nose syndrome). If bat populations in South Dakota have been infected with this fungus, wind turbine mortalities could have a more significant cumulative impact on populations. However, little is known about bat populations in South Dakota. Most mortality has involved migrant or dispersing bats rather than residents (Johnson 2005; Johnson *et al.* 2003; Keeley 2001). Bat mortality from collisions with turbines at the Crow Lake Alternative would likely occur. However, bat call studies in 2009 indicate low bat activity at the Crow Lake Alternative so the frequency of collisions may be low based on recently collected bat data.

Based on the expected impacts to bats described above, Wildlife Significance Criteria 1 and 2 (**Section 4.4.2**) would not be exceeded, and impacts to bats would be less than significant.

Reptiles/Amphibians

Impacts to reptiles and amphibians would be similar to those described for mammals (**Section 4.4.3.1** Wildlife, Mammals), although they are not as mobile as many mammals. Activities associated with construction, operation and decommissioning could result in the direct mortality of reptiles and amphibians if they are not able to move away from equipment and other vehicles. These impacts would be less than significant based on the small amount of habitat that would be temporarily and permanently removed and the low likelihood for direct mortality of individuals. Wildlife Significance Criteria 1 and 2 would not be exceeded, and impacts to reptiles/amphibians would be less than significant.

Birds

The 2008 PII study evaluated possible impacts to biological resources in accordance with USFWS guidelines. A reference site was chosen (Lake Andes National Wildlife Refuge) in an area with good habitat values for birds for comparison purposes. High scores indicate good general habitat value, and that biological resource impacts would be more likely if the area was to be disturbed. The Crow Lake Alternative PII score of 239 is considerably lower than that of the Lake Andes reference area (PII of 331). The high score at the reference site can be attributed to the presence of more, and probably higher quality, wetland and grassland areas. The results of ongoing migratory and breeding bird surveys at the Crow Lake Alternative, when available, will aid in further assessing possible impacts to avian species and developing additional conservation measures.

Construction impacts common to all avian species include direct mortality, habitat alteration (fragmentation) or loss, disturbance related to noise, the presence of large structures on the landscape and increased human presence resulting in displacement of individual birds. Mortality is associated with destruction of eggs or abandonment of active nests due to disturbance. Migratory and breeding bird surveys in 2009 indicate that the Crow Lake Alternative supports populations of grassland birds, including a number of species protected under the MBTA and USFWS BCC.

Construction would not last longer than one nesting season, but would occur during the nesting period for many bird species. Ground nesting species such as Ferruginous Hawk, Northern Harrier, Greater Prairie Chicken, and Sharp-tailed Grouse along with low vegetation nesting songbirds would be at higher risk for impacts from disturbance. Although construction activities may result in some level of egg loss and nest abandonment, measures would be implemented to minimize these impacts. The Applicants would attempt to do as much grading and other ground disturbance as possible before the start of the breeding season. If construction is to take place during the migratory bird breeding or nesting season, avian nest surveys, including grouse lek surveys, would be conducted within all non-cropland areas subject to temporary or permanent disturbance immediately prior to construction in that area. All active nests and leks would be marked as avoidance areas. Ongoing consultation with SDGFP is in progress to evaluate potential impacts to leks. Thus, loss and nest abandonment would represent a less than significant impact, because Wildlife Significance Criteria 1 and 2 (**Section 4.4.2**) would not be exceeded.

The Proposed Project would result in the permanent loss of approximately 97 acres of mixed-grass prairie habitat (**Table 4.4-1**), which represents a small proportion of this habitat (0.4 percent). The spacing of turbines and access roads could contribute to habitat fragmentation in the Crow Lake Alternative. Construction noise and associated human activity could temporarily disturb or displace individual birds and may interfere with migration, foraging, breeding and nesting. Studies have suggested that noise from construction and human activities disturb upland bird species, displacing birds from traditional habitats, reducing use of leks and causing nest abandonment (Young *et al.* 2003a). Disturbance would be limited to the duration of construction activities. Construction-related disturbance would be limited to a single migratory (both spring and fall) and breeding-nesting season; however, survival and reproductive success would be temporally reduced. Impacts would be less than significant, because Wildlife Significance Criteria 1 and 2 (**Section 4.4.2**) would not be exceeded.

The types of impacts associated with operation and maintenance of the Proposed Project are similar to those described for construction activities, although several mechanisms are different. Bird fatalities resulting from collisions with turbines have been documented at most operational wind farms and have involved a variety of bird species, including passerines, raptors, waterfowl and shorebirds (Erickson *et al.* 2003). Data indicate bird vulnerability to collisions with turbines is species-specific, habitat-specific and facility-specific (Erickson *et al.* 2001), with mortality rates being related to the number of turbines (EFSEC 2003). Other factors that influence avian mortality include the arrangement of turbines (*i.e.*, end turbines have higher collision rates), proximity to migration corridors and rim edges, structure type (*e.g.*, lattice structures provide perches within the Rotor Sweep Area [RSA]), tower height (*i.e.*, blades are closer to the ground on shorter turbines), conditions that reduce visibility (*i.e.* fog), and attractants such as abundant prey resources and certain FAA marker lights (Johnson *et al.* 2003; NWCC 2003).

U.S. wind farm facilities average 2.19 avian fatalities per turbine per year (Erickson *et al.* 2001). The average is reduced to 1.83 fatalities per turbine per year if the Altamont Pass wind farm in California is excluded from calculations (Altamont Pass has experienced high mortality rates due to facility design and siting factors). Passerines make up more than 80 percent of all bird fatalities at wind farms (Erickson *et al.* 2001), and mortality rates at wind farms have not created population-level effects for any species (Young and Erickson 2003). Waterfowl and shorebird mortality at wind farms has been minimal (Erickson *et al.* 2003; Koford 2005). Average raptor mortality rates are 0.03 raptor per turbine per year overall, and 0.006 raptors per turbine per year excluding Altamont Pass (Erickson *et al.* 2001). Raptor mortality has been absent to very low at most newer generation wind facilities (NWCC 2003). Based on the results from other wind farms, a ranking of seasonal mean raptor use was developed. Mean raptor use in the Crow Lake Alternative during spring of 2009 was low (0.34 raptors/plot/20-minute survey), ranking thirty-third relative to data collected at 43 other existing and proposed wind farms (WEST 2009a).

Mean raptor use is determined by dividing the total number of raptors observed by the total number of 800-meter plots and the total number of surveys. Based upon these data, raptor use of the Crow Lake area is not greater than that observed at most existing and proposed wind farms (WEST 2009a). Higher raptor concentrations are known along the Missouri River corridor 30 miles west of the Crow Lake area (South Dakota Birds 2009).

As part of the Proposed Project, BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**) have been included to reduce avian mortality associated with turbine operation. Tubular structures and newer generation turbines (GE 1.5sle; see **Section 2.3.1**) would eliminate the creation of perching sites within the area and decrease the risk of avian collisions (Erickson *et al.* 2002). A post-construction monitoring program to assess avian mortality, including adaptive management provisions, would be designed and implemented in coordination with the USFWS, Western, RUS and SDGFP. Data obtained through baseline avian use surveys and local habitat characterization suggest that avian mortality rates are likely to be similar to or lower than those experienced at other wind farms. While the Proposed Project design and application of the included BMPs and APMs (as listed in **Chapter 2, Table 2.2 and Table 2.3**) would further reduce fatalities, avian mortality would occur. Impacts would be less than significant, because Wildlife Significance Criteria 1 and 2 (**Section 4.4.2**) would not be exceeded.

Noise and human activities associated with operation and maintenance of the Proposed Project would result in temporary disturbance similar to those discussed for construction, but at reduced intensity. Regional roads may experience increased traffic due to interest in seeing the operational turbines, although traffic would generally be restricted to public roads, thereby minimizing potential impacts. New roads would be constructed for access to the turbines, but the majority of these roads would be gated and located on private land, minimizing or eliminating increased public access.

The presence of turbines and operation and maintenance activities could result in longer-term effects, including avoidance and abandonment of habitats in proximity to the Proposed Project. Research has indicated that displacement effects associated with wind turbines are specific to the project location and individual bird species. Studies have identified reduced avian use in habitats within 164 to 590 feet of turbines (Johnson *et al.* 2000; Erickson *et al.* 2007), and grassland species specifically decreased use of habitats near turbines (Erickson *et al.* 2007, Leddy *et al.* 1999). Displacement could result in reduced breeding success, productivity and survival. Baseline surveys have been initiated to assess pre-construction avian abundance and habitat use in the Crow Lake Alternative. Reference sites have been established outside of potential impact areas within the Crow Lake Alternative boundary for comparison. Post-construction monitoring would continue surveys for a minimum of three years to evaluate species-specific changes in abundance, habitat use and displacement effects associated with operation of the Proposed Project compared to general avian communities (**Chapter 2, Tables 2.2 and 2.3**). In addition, Whooping Crane and Sandhill Crane monitoring would occur concurrently for a minimum of three years. Both of these studies would improve the understanding of species-specific disturbance and displacement effects associated with development of the Proposed Project.

Operation and maintenance activities and the presence of turbines could also fragment habitat for grassland species. The Crow Lake Alternative mixed-grass prairie ecosystem is relatively fragmented, mainly due to the presence of cropland and roads. Human activity, turbines and access roads could further fragment habitats for avian species. The actual fragmentation effects are difficult to quantify, but would likely be species-specific and could disrupt movement between seasonal habitats. In the worst case, these effects would lead to some reduction of breeding success, productivity and survival. A post-construction monitoring program would help determine fragmentation effects (**Chapter 2, Tables 2.2 and 2.3**).

Based on the localized impacts to birds described above and implementation of the included BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), Wildlife Significance Criteria 1 and 2 (**Section 4.4.2**) would not be exceeded. If the MBTA is violated, Wildlife Significance Criterion 2 would be exceeded; however, impacts to birds would be less than significant.

Special Status Species

Federal-Listed Species

Whooping Crane: Suitable habitat for the Whooping Crane in the Crow Lake Alternative includes stopover, roosting and foraging habitats. The Crow Lake Alternative is within the

Aransas-Wood Buffalo Population migration corridor. Previous sightings in the region, large numbers of Sandhill Cranes (a surrogate species of the Whooping Crane), and the presence of suitable habitat make it possible that Whooping Cranes occasionally fly over and land in the Crow Lake Alternative during seasonal migrations, and operating turbines could pose a threat. Whooping Crane occurrence increases closer to the Missouri River, the approximate centerline of the migration corridor, 30 miles west of the Crow Lake Alternative. Suitable habitat is present throughout the migration corridor and the Crow Lake Alternative, and use of the entire corridor is likely during any migratory cycle. Inclement weather, predation and human disturbance may cause Whooping Cranes to stray considerable distances from the centerline of the corridor. Structures, such as wind turbines and transmission lines, pose a collision risk (although unlikely) for Whooping Cranes due to poor visibility during inclement weather and poor flying agility of cranes. To date, there are no documented occurrences of Whooping Crane collisions with wind turbines; however, it is theoretically foreseeable. As included in the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), surveys of the transmission lines would be conducted as part of the post-construction avian monitoring program, and the transmission line would be marked with bird flight diverters where appropriate to reduce the risk to Whooping Cranes.

During migration, Whooping Cranes may also forage and roost in habitats at the Crow Lake Alternative during stopovers. Whooping Cranes fly at lower altitudes between roosting and foraging habitat, placing them at risk of collision with turbines during take-off, landing, inclement weather and movement between foraging and roosting habitat.

Effects will be determined in the BA, which is under preparation. Western and RUS will follow USFWS recommendations provided through the Section 7 consultation process.

<u>Topeka Shiner:</u> Direct effects to the Topeka shiner would not occur; no stream crossings are proposed to tributaries to West Branch Firesteel Creek. Further, there would be no water withdrawals from this watershed for construction, operation or maintenance activities. Indirect impacts, such as sedimentation, would be precluded through the implementation of the BMPs and APMs (**Chapter 2, Tables 2.2. and 2.3**).

Effects will be determined in the BA, which is under preparation. Western and RUS will follow USFWS recommendations provided through the Section 7 consultation process.

<u>Piping Plover:</u> While it is possible that Piping Plovers could collide with turbines or overhead lines, such collisions would be unlikely due to the lack of suitable habitat in the area. Nesting activities occur along the Missouri River and alkaline shores; therefore, it is unlikely that Piping Plover occur in the Crow Lake Alternative.

Effects will be determined in the BA, which is under preparation. Western and RUS will follow USFWS recommendations provided through the Section 7 consultation process.

State-Listed Species

Bald Eagle: The Bald Eagle may occur in the Crow Lake Alternative during winter months as a transient resident. The Proposed Project could affect the Bald Eagle as a result of temporary disturbance or displacement associated with construction, operation and decommissioning activities, minor losses of foraging habitat, and mortality of individuals via collision with turbines. Traffic, noise and human presence during construction, operation and decommissioning could displace individual Bald Eagles foraging in the vicinity. However, the Crow Lake Alternative contains a limited amount of suitable foraging habitat, so construction, operation and decommissioning activities would have minimal effect on Bald Eagles. The included BMPs and APMs (as listed in **Chapter 2, Tables 2.2 and 2.3**) would be implemented as part of the Proposed Project to minimize disturbance and displacement effects. Construction activities would be modified or curtailed when Bald Eagles are present to reduce disturbance. Also, construction crews would be instructed to avoid disturbing or harassing wildlife (including Bald Eagles) and to report any Bald Eagle sightings to the appropriate agencies as dictated by an ABPP.

The Proposed Project is not likely to result in Bald Eagle mortality. Raptor mortality has been relatively low at wind farms and there have been no reported Bald Eagle fatalities at any wind facilities in the western U.S. (Erickson *et al.* 2002; Johnson *et al.* 2000; Young *et al.* 2003). The probability of Bald Eagle mortality would be further minimized because there are very few roosting trees and no known nesting in the Crow Lake Alternative. The collection system would be underground, eliminating the risk of collision and electrocution from new transmission lines. Overhead transmission lines would be constructed using Avian Power Line Interaction Committee (APLIC) guidelines to reduce the potential for collision or electrocution (APLIC 2006). As included in the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), surveys of the transmission lines would be conducted as part of the post-construction avian monitoring program, and the transmission line would be marked with bird flight diverters where appropriate Impacts would be less than significant, because Special Status Species Significance Criteria 1, 2, 3 and 4 (**Section 4.4.2**) would not be exceeded.

State and Federal Species of Concern

Greater Prairie Chicken and Sharp-tailed Grouse: As discussed above, suitable habitat for Greater Prairie Chickens and Sharp-tailed Grouse is present in the Crow Lake Alternative.

Construction effects would be similar to those previously described for grassland species. To minimize effects upon Greater Prairie Chickens and Sharp-tailed Grouse, no construction activities would be permitted within a pre-determined radius of a known active lek between March 1 and May 1. Impacts would be less than significant (the Applicants are currently in consultation with SDGFP), because Special Status Species Significance Criteria 1, 2, 3 and 4 (**Section 4.4.2**) would not be exceeded.

Possible operation and maintenance impacts for Prairie Chickens and Sharp-tailed Grouse are similar to those described for grassland species, although collision-related mortality of Prairie Chickens and Sharp-tailed Grouse has been relatively rare at wind farms (Erickson *et al.* 2002). Grouse and Greater Prairie Chickens could fly within the turbine's RSA, which puts them at risk for collision with turbine blades. While the chance for collision-related mortality of Greater Prairie Chicken and Sharp-tailed Grouse is low, post-construction monitoring of avian mortality would help to evaluate fatalities and identify turbines causing disproportionate mortality rates (**Chapter 2, Tables 2.2 and 2.3**). The turbine design would prevent the creation of raptor perches that can result in increased predation upon Sharp-tailed Grouse and Greater Prairie Chickens. If increased predation does occur and the cause is identifiable, onsite mitigation (*i.e.* raptor or raven deterrent devices) would be developed to correct the issue. Impacts would be less than significant, because Special Status Species Significance Criteria 1, 2, 3 and 4 (**Section 4.4.2**) would not be exceeded.

Noise and human activities associated with operation and maintenance would result in temporary disturbances to Sharp-tailed Grouse and Greater Prairie Chickens similar to those previously discussed for construction, although to a lesser extent. Although no studies have been conducted to evaluate the effects of turbine presence on Greater Prairie Chickens and Sharp-tailed Grouse, there is anecdotal evidence that these species exhibit avoidance of tall structures (Braun 1998; Bidwell *et al.* 2004). For example, Lesser Prairie Chickens avoid even high-quality habitat within 656 feet of a single oil or gas well pump, within 1,968 feet of an improved road and within 3,280 feet of a transmission line (Bidwell *et al.* 2004). Greater Prairie Chickens in Oklahoma have been shown to avoid areas within 1,600 feet of transmission lines (Pruett *et al.* 2009). Accordingly, the presence of turbines and transmission lines could displace Greater Prairie Chickens and Sharp-tailed Grouse from habitats in the vicinity of these facilities. Turbines could also fragment Greater Prairie Chicken and Sharp-tailed Grouse habitat by disrupting movement between seasonal habitats. While difficult to quantify, it is likely that the Proposed Project would result in the effective loss of a small portion of suitable Greater Prairie Chicken and Sharp-tailed Grouse habitat and could adversely affect individual reproduction and survival, although population level impacts are not anticipated. As included in the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), pre- and post-construction avian use surveys would help document habitat effects associated with the presence of turbines, and the ABPP would provide protective measures. Impacts would be less than significant (the Applicants are currently in consultation with SDGFP), because Special Status Species Significance Criteria 1, 2, 3 and 4 (**Section 4.4.2**) would not be exceeded.

<u>Grassland Bird Species (Le Conte's Sparrow, Chestnut-collared Longspur, Grasshopper Sparrow, Western Meadowlark, Upland Sandpiper, Marbled Godwit, Long-billed Curlew, Lark Bunting, Red-headed Woodpecker, McCown's Longspur, Dickcissel, Loggerhead Shrike):</u> Grassland species of concern occur in the Crow Lake Alternative as migratory and breeding residents, and several were observed during spring and summer surveys. Adverse impacts associated with construction, operation and decommissioning would be similar to those described in **Section 4.4.3.1, Wildlife, *Birds*** and would be reduced through implementation of

the included BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**). Impacts would be less than significant because Special Status Species Significance Criteria 1, 2 and 3 (**Section 4.4.2**) would not be exceeded. If the MBTA is violated, Special Status Species Significance Criterion 4 would be exceeded; however with the implementation of the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), impacts to grassland birds would be less than significant.

Wetland Bird Species (American Bittern, Wilson's Phalarope, Black-crowned Night Heron, Black Tern): Wetland bird species may occur in the Crow Lake Alternative as summer residents since suitable breeding habitat is present. Black-crowned Night Herons were observed during spring or summer surveys; the other three species were not observed. Pre-construction nest surveys would identify nesting species and nest disturbance would be avoided.

Construction activities could temporarily disturb wetland species in the vicinity, although direct impacts to wetland habitats would be minimal or avoided completely. Operation may result in collisions with turbines, causing injury or death or result in displacement if turbines are constructed near wetlands. Impacts would be less than significant, because Special Status Species Significance Criteria 1, 2,and 3 (**Section 4.4.2**) would not be exceeded. If the MBTA is violated, Special Status Species Significance Criterion 4 would be exceeded; however with the implementation of the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), impacts to wetland birds would be less than significant.

Raptor Species (Northern Harrier, Ferruginous Hawk, Swainson's Hawk, Burrowing Owl, Prairie Falcon): Raptor species may occur in the Crow Lake Alternative as summer residents, and suitable breeding habitat is present (WEST 2009a). Adverse impacts associated with construction, operation and decommissioning of the Proposed Project would be the same as those described in **Section 4.4.3.1, Wildlife, *Birds***. Pre-construction nest surveys would identify nesting raptors and nest disturbance would be avoided. Impacts would be less than significant, because Special Status Species Significance Criteria 1, 2, and 3 (**Section 4.4.2**) would not be exceeded. If the MBTA is violated, Special Status Species Significance Criterion 4 would be exceeded; however with the implementation of the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), impacts to raptors would be less than significant.

Regal Fritillary Butterfly: Regal fritillary butterflies may occur in the area and suitable habitat is assumed to be present. Adverse impacts associated with construction include habitat loss and mortality. Habitat loss would be directly proportional to the amount of ground disturbance and would be minimal when compared to suitable habitat in the region. Regal fritillary butterflies were not observed during spring or summer avian use surveys, but there has been no survey specifically designed to determine the presence or absence of this species. No studies have evaluated the effects of wind farms on regal fritillary butterflies, and it is difficult to predict the disturbance and displacement effects. General studies of butterfly mortality attributed to turbine strikes indicate that it is likely low due to wind currents generated from turbine rotation (Grealey and Stephenson 2007). Construction activities would temporarily disturb regal fritillary butterflies in the vicinity and could result in habitat loss. Operation could result in collisions with turbines, resulting in injury or death. These impacts would be less than significant because Special Status Species Significance Criterion 1 (**Section 4.4.2**) would not be exceeded.

Western's Proposed Federal Action

If the Proposed Project is approved, development of the Western system modifications at its Wessington Springs Substation would not cause the loss of habitat for wildlife species since any changes would be confined to a previously disturbed and graded area. Construction, operation and decommissioning activities could result in the direct mortality of wildlife species if they are not able to move away from equipment and vehicles traveling to the substation. There is a potential for wildlife-electrical equipment interactions during the operation of the proposed substation additions, but it is expected that these interactions would be low. The substation additions would be designed in accordance with the latest APLIC guidelines (APLIC 2006), and would employ the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**). The effects of any interactions would be less than significant.

4.4.3.2 Winner Alternative

Vegetation

Construction of the Proposed Project would result in temporary and permanent impacts to existing vegetation within the Winner Alternative. The majority of these impacts would be in the mixed-grass prairie and cropland vegetation communities. The area of direct and indirect impacts within each vegetation class based on vegetation community mapping for the Proposed Project (Tierra EC 2009) is presented in **Table 4.4-2.** Additionally, the Winner Alternative would not result in temporary or permanent disturbance within USFWS grassland easements.

The Winner Alternative would result in the temporary disturbance of approximately 2,314 acres of mixed-grass prairie, 741 acres of cropland, 16 acres of wetlands, 63 acres of farmstead and already disturbed areas, 31 acres of shelterbelts, and 22 acres of deciduous forest. Construction at the Winner Alternative would result in the permanent disturbance of approximately 184 acres of mixed-grass prairie, 62 acres of cropland, 1.8 acres of wetlands, 8.2 acres of farmstead and already disturbed areas, 3.6 acres of shelterbelts and 0.9 acres of deciduous forest. Mixed-grass prairie is principally rangeland and pasture. Impacts that would occur to cultivated lands are not considered biologically significant because these lands are frequently disturbed by tilling, planting and harvesting activities associated with crop production.

The Winner Alternative would permanently remove approximately 184 acres of mixed-grass prairie (rangeland and pasture). These losses would be widely dispersed across the area which has 53,925 acres of mixed-grass prairie, amounting to a very small percentage of the total area (0.3 percent). Access roads would increase fragmentation of native rangeland, in some cases resulting in smaller patches of the remaining grassland types, although the Winner Alternative is currently a mosaic of mixed-grass prairie and cropland (**Figure 3.4-3),** more so than the Crow Lake Alternative.

Table 4.4-2 Summary of Disturbance Areas within Vegetation Communities in the Winner Alternative

Vegetation Type	Total Temporary Disturbance (acres)	Total Permanent Disturbance (acres)
Mixed-grass prairie	2,314	184
Cropland	741	62
Wetlands	16	1.8
Farmstead	63	8.2
Shelterbelt	31	3.6
Deciduous forest	22	0.9
Total area	3,187	261

Note: Discrepancies may exist in total values due to rounding.

The types of permanent and temporary loss of vegetation would be similar to those described in **Section 4.4.3.1, Vegetation**, although temporary and permanent disturbance areas would be more than double that for the Crow Lake Alternative, mainly due to the need for more access roads, longer underground collection lines and more crane walks.

Physical ground disturbance, construction vehicles and possibly increased public access could facilitate the establishment and spread of noxious weeds. South Dakota has 27 documented noxious weed species, 12 of which occur in Tripp County (see **Table 3.4-4**). The types of impacts would be similar to those described in **Section 4.4.3.1, Vegetation** for noxious weeds, although impacts may be higher at the Winner Alternative because more than twice the area would be disturbed.

Fugitive dust impacts would be similar to those described in **Section 4.4.3.1, Vegetation**, although more fugitive dust would be generated during construction, operation and decommissioning activities due to the larger temporary and permanent disturbance areas at the Winner Alternative.

The construction of more access roads could result in a greater increase in public access than that described in **Section 4.4.3.1, Vegetation**, although most new roads would be on private land and access would be limited.

These impacts would not affect the biological viability of any local, regional or national plant populations. Because the footprint of the Proposed Project is relatively small compared with the overall size of the Winner Alternative and much of the area is tilled annually for agricultural production, direct impacts to vegetation would be minimal.

Wetland delineation will be completed, and facilities would be moved based on the results such that wetland impacts are minimized or avoided. If the Applicants cannot avoid wetland impacts, a Section 404 permit under the Clean Water Act would be obtained through the USACE.

Based on the minimal impacts to vegetation resources described above, impacts to Vegetation Significance Criteria 1 and 2 (**Section 4.4.2**) would not occur, and impacts to vegetation resources due to construction and operation of the Proposed Project would be less than significant.

Wildlife

Mammals (excluding bats)

The types of impacts to mammal species would be similar to those described in **Section 4.4.3.1, Wildlife, *Mammals,*** although the impacts would occur on a larger scale. The Winner Alternative would result in the temporary disturbance of 3,188 acres of habitat, while 261 acres would become permanently unavailable. The area permanently disturbed represents a relatively small amount (0.3 percent) of habitat available regionally. This small loss of habitat would not disrupt breeding, rearing or wintering behavior and would not influence the viability of local populations.

Noise, excavation and other forms of disturbance during construction could potentially temporarily displace more wildlife species than at the Crow Lake Alternative within or adjacent to the disturbed areas. Upon completion of construction, wildlife species would become accustomed to operation and maintenance activities and would be expected to resume utilization of the area. Permanent vegetation loss could destroy small mammal habitat, but population level effects would be negligible because only 0.3 percent of the area would be permanently disturbed.

The probability for direct mortality of species resulting from construction activities or vehicle collision is low at the Winner Alternative, although it is higher than at the Crow Lake Alternative. Based on the minimal impacts to mammals described above, Wildlife Significance Criteria 1 and 2 (**Section 4.4.2**) would not be exceeded, and impacts to mammals would be less than significant.

Bats

Construction could affect bats through direct mortality, habitat loss and fragmentation and disturbance effects (SDBWG and SDGFP 2009). Bat use surveys for the Winner Alternative are ongoing. There are no known roosts within or adjacent to the area. The probability of construction-related bat mortality is extremely low given their mobility and the absence of any roosts. Habitat loss and fragmentation effects to bats are also expected to be minimal. The permanent loss of approximately 184 acres of mixed-grass prairie foraging habitat would not represent an adverse effect to bats given the large adjacent tracts of similar habitat. No shrub or forested riparian habitats or other areas of concentrated bat use would be affected. A total of 3.6 acres of shelterbelt and 0.9 acres of deciduous forest, representing less than 0.2 percent of potential daytime roosting habitat, may be permanently removed. Construction would generally occur during daylight hours and would not result in any disturbance effects for these nocturnal animals.

Operation and maintenance impacts to bats would be similar to those described in **Section 4.4.3.1, Wildlife, *Bats***, although the increase in access roads could further fragment foraging habitat for bats.

Collision-related bat mortality would be similar to that described in **Section 4.4.3.1, Wildlife, *Bats***. However, bat call studies in 2009 indicate low bat activity in the Winner Alternative area so the frequency of collisions may be low.

Based on the expected impacts to bats described above, Wildlife Significance Criteria 1 and 2 (**Section 4.4.2**) would not be exceeded, and impacts to bats would be less than significant.

Reptiles/Amphibians

The types of impacts to reptiles and amphibians would be similar to those described in **Section 4.4.3.1, Wildlife, *Amphibians/Reptiles***, although impacts may be higher at the Winner Alternative because there would be more than twice the area disturbed. These impacts would be minimal based on the small amount of habitat that would be temporarily and permanently removed and the low likelihood for direct mortality of individuals. Wildlife Significance Criteria 1 and 2 would not be exceeded, and impacts to reptiles and amphibians would be less than significant.

Birds

The 2008 PII study evaluated possible impacts to biological resources in accordance with USFWS guidelines. The Winner PII score of 269 is lower than that of the Lake Andes National Wildlife Refuge reference area (PII of 331) but higher than that of the Crow Lake Alternative (PII of 239). The higher score can be attributed to the presence of more wetlands and grassland areas. WEST, Inc. is conducting additional migratory and breeding bird surveys in the site area. These data, when available, will aid in assessing potential impacts to avian species and developing additional conservation measures.

Construction activities common to all avian species include direct mortality, habitat alteration (fragmentation) or loss and disturbance related to noise and increased human presence resulting in the displacement of individual birds. The types of construction impacts would be similar to those described in **Section 4.4.3.1, Wildlife, *Birds*** for avian species, although impacts may be higher at the Winner Alternative because there would be more than twice the area of disturbance. Loss and nest abandonment would result in less than significant impacts (including the Applicants' continuing consultation with SDGFP), because Wildlife Significance Criterion 1 (**Section 4.4.2**) would not be exceeded. If the MBTA is violated, Wildlife Significance Criterion 2 would be exceeded; however with the implementation of the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), impacts to birds would be less than significant.

The Proposed Project would result in the permanent loss of 184 acres of mixed-grass prairie habitat (**Table 4.4-2**), which represents a small proportion of the area (0.2 percent). The spacing of turbines and access roads could contribute to habitat fragmentation and may be higher at the Winner Alternative because of the need for more access roads. Construction noise and associated human activity could temporarily disturb or displace individual birds, and may interfere with migrating, foraging, breeding and nesting; these impacts are expected to be higher for the Winner Alternative. Construction-related disturbance would be limited to a single migratory (both spring and fall) and breeding-nesting season; however, survival and reproductive success would be temporally reduced. Impacts would be less than significant, because Wildlife Significance Criterion 1 (**Section 4.4.2**) would not be exceeded. If the MBTA is violated, Wildlife Significance Criterion 2 would be exceeded; however with the implementation of the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), impacts to birds would be less than significant.

Operation and maintenance of the Proposed Project could affect avian species through direct mortality, disturbance and displacement and habitat fragmentation, as described in **Section 4.4.3.1, Wildlife, *Birds***. Based on the results from other wind farms, a ranking of seasonal mean raptor use in the Winner Alternative during spring of 2009 was low (0.23 raptors/plot/20-minute survey), ranking thirty-ninth relative to data collected at 43 other existing and proposed wind farms (WEST 2009b) (**Table 3.4-10**). Based upon these data, raptor use of the Winner area is lower than that observed at most existing and proposed wind farms (WEST 2009b), and it is lower than that observed at the Crow Lake Alternative. Higher raptor concentrations are known along the Missouri River corridor 25 miles east of the Winner area (South Dakota Birds 2009).

As described in **Section 4.4.3.1, Wildlife, *Birds*** and through implementation of the included BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), measures have been included to reduce avian mortality. Data obtained through baseline avian use surveys and habitat characterization suggest that avian mortality rates are likely to be similar to or lower than those experienced at other wind farms. While the Proposed Project design, including BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), would further reduce likely fatalities, avian mortality would occur as a result of the Proposed Project. Impacts would be less than significant, because Wildlife Significance Criterion 1 (**Section 4.4.2**) would not be exceeded. If the MBTA is violated, Wildlife Significance Criterion 2 would be exceeded; however with the implementation of the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), impacts to birds would be less than significant.

Noise and human activities associated with operation and maintenance of the Proposed Project would result in temporary disturbance similar to those discussed for construction, but at reduced intensity. Regional roads may experience increased traffic due to interest in seeing the operational turbines; traffic would generally be restricted to public roads, thereby minimizing potential impacts. New roads would be constructed for access to the turbines, but the majority of these roads would be gated and located on private land, minimizing or eliminating increased public access.

The presence of turbines and operation and maintenance activities could result in longer-term effects, including avoidance and abandonment of habitats in proximity to the turbines (see **Section 4.4.3.1, Wildlife, *Birds***). Baseline surveys have been initiated to assess pre-construction avian abundance and habitat use in the Winner Alternative. Reference sites have also been established outside of potential impact areas within the Winner Alternative boundary for comparison. Post-construction monitoring would continue pre-construction baseline surveys for three years to evaluate species-specific changes in abundance, habitat use and displacement effects associated with operation of the Proposed Project compared to general avian communities (**Chapter 2, Tables 2.2 and 2.3**). In addition, Whooping Crane and Sandhill Crane monitoring would occur concurrently for a minimum of three years. Both of these studies would improve the understanding of species-specific disturbance and displacement effects associated with development of the Proposed Project.

Operation and maintenance activities and the presence of turbines could also fragment habitat for grassland species. The Winner mixed-grass prairie ecosystem is relatively fragmented, mainly due to the presence of cropland and roads, although it is more intact than the Crow Lake Alternative. Human activity, turbines and access roads could further fragment habitats for avian species. The actual fragmentation effects are difficult to quantify, but would likely be species-specific and could disrupt movement between seasonal habitats. In the worst case, these effects would lead to some reduction of breeding success, productivity and survival. A post-construction monitoring program would help determine fragmentation effects.

Based on the localized impacts to birds described above, Wildlife Significance Criterion 1 (**Section 4.4.2**) would not be exceeded and impacts to birds would be less than significant. If the MBTA is violated, Wildlife Significance Criterion 2 would be exceeded; however with the implementation of the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), impacts to birds would be less than significant.

Special Status Species

Federal-Listed Species

Whooping Crane: Suitable habitat for the Whooping Crane in the Winner Alternative includes stop over, roosting and foraging habitats. The Winner Alternative is within the Aransas-Wood Buffalo Population migration corridor. Previous sightings in the region, large numbers of Sandhill Cranes (a surrogate species of the Whooping Crane), and the presence of suitable habitat make it possible that Whooping Cranes occasionally fly over and land in the Winner Alternative during seasonal migrations. Operating turbines could pose a threat. Whooping Crane occurrence increases closer to the Missouri River, the approximate centerline of the migration corridor 25 miles east of the Winner Alternative. Suitable habitat is present throughout the migration corridor, and Whooping Cranes have been documented in the Winner Alternative. Use of the entire corridor is likely during any migratory cycle. Inclement weather, predation and human disturbance may cause Whooping Cranes to stray from the centerline of the migration corridor. Structures, such as wind turbines and transmission lines, pose a collision risk (although unlikely) for Whooping Cranes due to poor visibility during inclement weather and poor flying agility of cranes. To date, there are no documented occurrences of Whooping Crane collisions with wind turbines; however, it is theoretically foreseeable. As included in the BMPs and APMs

(**Chapter 2, Tables 2.2 and 2.3**), surveys of the transmission lines would be conducted as part of the post-construction avian monitoring program, and the transmission line would be marked with bird flight diverters where appropriate to reduce the risk to Whooping Cranes.

During migration, Whooping Cranes may also forage and roost in habitats at the Winner Alternative during stopovers. Whooping Cranes fly at lower altitudes between roosting and foraging habitat, placing them at risk of collision with turbines during take-off, landing, inclement weather and movement between foraging and roosting habitat.

Effects will be determined in the BA, which is under preparation. Western and RUS will follow USFWS recommendations provided through the Section 7 consultation process.

<u>American Burying Beetle:</u> Suitable habitat for the American burying beetle occurs within most of the Winner Alternative and the beetle has been documented in the area. Suitable habitat could include mixed-grass prairie, deciduous forest and shelterbelts (56,650 acres). It is difficult to estimate the population with the area, although temporary and permanent disturbance could result in disturbance and loss of 2,367 acres and 189 acres of habitat, respectively.

Effects will be determined in the BA, which is under preparation. Western and RUS will follow USFWS recommendations provided through the Section 7 consultation process.

State-Listed Species

<u>Fish Species (blacknose shiner, northern redbelly dace, pearl dace):</u> Direct impacts on the blacknose shiner, northern redbelly dace and pearl dace would be unlikely because turbines would be placed in upland areas. There is a potential for indirect impacts due to the construction of stream crossings for access roads and collection lines introducing sedimentation into stream channels. Increased sedimentation can result in the loss of spawning substrate, which may reduce recruitment. Siltation of gravel substrate may also greatly reduce invertebrate populations, thereby affecting the food source for these species. Access roads would be designed as low-water, at-grade gravel crossings, or culverts would be installed, reducing impacts to fish habitat. The roadbed would be designed to allow water to percolate through the gravel overlay. Construction would not involve any dewatering practices or disruption of the streambed. No damming effect would occur. Any increases in sedimentation would be short term during the construction phase. Sedimentation is not expected to increase as a result of operation and maintenance activities.

Other possible indirect impacts to fish species include the introduction of hazardous waste into stream channels through accidental spilling. This risk would be minimized by maintaining refueling areas and hazardous waste storage areas away from the stream channels.

Stormwater and erosion and sediment control BMPs and APMs would be used during construction and operation of the Proposed Project including the use of directional boring under all streams with flowing water, silt traps, stream bank stabilization and revegetation of disturbed areas adjacent to perennial streams. Impacts to this species would be less than significant because Special Status Species Significance Criteria 1, 2 and 3 (**Section 4.4.2**) would not be exceeded.

State and Federal Species of Concern

Greater Prairie Chicken and Sharp-tailed Grouse: Suitable habitat for Greater Prairie Chickens and Sharp-tailed Grouse is present in the Winner Alternative, and active leks are known in the area (WEST 2009b). Construction effects would be similar to those described in **Section 4.4.3.1, Wildlife, *Birds*** for grassland species, although more leks were confirmed at the Winner Alternative, so impacts may be higher. To minimize effects upon Greater Prairie Chickens and Sharp-tailed Grouse, no construction activities would be permitted within a pre-determined radius of known, active leks between March 1 and May 1. Impacts would be less than significant (the Applicants are currently in consultation with SDGFP), because Special Status Species Significance Criteria 1, 2, 3 and 4 (**Section 4.4.2**) would not be exceeded.

Possible operation and maintenance impacts for Greater Prairie Chickens and Sharp-tailed Grouse are similar to those described in **Section 4.4.3.1, Wildlife, *Birds***, although more leks were confirmed (WEST 2009b) so impacts to these species may be higher. Impacts would be less than significant, because Special Status Species Significance Criteria 1, 2, 3 and 4 (**Section 4.4.2**) would not be exceeded.

Noise and human activities associated with operation and maintenance would result in temporary disturbances to Greater Prairie Chickens and Sharp-tailed Grouse similar to those previously discussed in **Section 4.4.3.1, Wildlife, *Birds***. These temporary disturbances and would represent a less than significant impact (the Applicants are currently in consultation with SDGFP), because Special Status Species Significance Criteria 1, 2, 3 and 4 (**Section 4.4.2**) would not be exceeded.

Grassland Bird Species (Chestnut-collared Longspur, Grasshopper Sparrow, Western Meadowlark, Upland Sandpiper, Marbled Godwit, Long-billed Curlew, Lark Bunting, Orchard Oriole, Prairie Falcon, Red-headed Woodpecker, Loggerhead Shrike, Dickcissel): Grassland species of concern occur in the Winner Alternative as migratory and breeding residents. Suitable non-breeding and breeding habitat is present for these species, and several were observed during spring and summer surveys. Adverse impacts associated with construction, operation and decommissioning would be similar to those described in **Section 4.4.3.1, Wildlife, *Birds.***

Impacts would be less than significant, because Special Status Species Significance Criteria 1, 2 and 3 (**Section 4.4.2**) would not be exceeded. If the MBTA is violated, Special Status Species Significance Criterion 4 would be exceeded; however with the implementation of the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), impacts to grassland birds would be less than significant.

Wetland Bird Species (American Bittern, Wilson's Phalarope, Black Tern, Trumpeter Swan, American White Pelican): Wetland bird species may occur in the Winner Alternative as summer residents, since suitable breeding habitat is present. Wilson's Phalaropes were observed during spring or summer surveys; the other four species were not observed (WEST 2009b). Pre-construction nest surveys would identify nesting species and nest disturbance would be avoided.

Construction activities would temporarily disturb wetland species in the vicinity. Operation may result in collisions with turbines, causing injury or death. Impacts would be less than significant, because Special Status Species Significance Criteria 1, 2 and 3 (**Section 4.4.2**) would not be exceeded. If the MBTA is violated, Wildlife Significance Criterion 4 would be exceeded; however with the implementation of the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), impacts to wetland birds would be less than significant.

<u>Raptor Species (Northern Harrier, Ferruginous Hawk, Swainson's Hawk, Burrowing Owl):</u> Raptor species may occur in Winner Alternative as summer residents, and suitable breeding habitat is present (WEST 2009b). Adverse impacts associated with construction, operation and decommissioning would be similar to those described in **Section 4.4.3.1, Wildlife, *Birds.*** Impacts would be less than significant, because Special Status Species Significance Criteria 1, 2 and 3 (**Section 4.4.2**) would not be exceeded. If the MBTA is violated, Wildlife Significance Criterion 4 would be exceeded; however with the implementation of the BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**), impacts to raptors would be less than significant.

<u>Plains Spotted Skunk:</u> Plains spotted skunks occur in the northern portion of the Winner Alternative just south of Winner (SDNHP 2009). Impacts to this species would be similar to those described in **Section 4.4.3.1, Wildlife, *Mammals***, although they would occur on a larger scale. Overall, 2,314/ 184 acres of mixed-grass prairie and 741/ 62 acres of cropland would be temporarily/ permanently disturbed, respectively. The area of habitat permanently disturbed represents a relatively small amount (0.3 percent) of habitat available regionally. This small loss of habitat would not disrupt breeding, rearing or wintering behavior and would not influence the viability of local populations. Impact to plains spotted skunk would be less than significant because Special Status Species Significance Criterion 1 (**Section 4.4.2**) would not be exceeded.

<u>Plains Topminnow:</u> Direct impacts on the Plains topminnow would be unlikely because turbines would be placed in upland areas. There is the possibility for indirect impacts due to the construction of stream crossings for access roads and collection lines introducing sedimentation into stream channels. Increased sedimentation can result in the loss of spawning substrate, which may reduce Plains Topminnow recruitment. Siltation of gravel substrate may also greatly reduce invertebrate populations, thereby affecting the food source for this species. Access roads would be designed as low-water, at-grade gravel crossings or culverts would be installed, reducing impacts to fish habitat. The roadbed would be designed to allow water to percolate through the gravel overlay. Construction would not involve any dewatering practices or disruption of the streambed. No damming effect would occur. Any increases in sedimentation would be short term during the construction phase. Sedimentation is not expected to increase as a result of operation and maintenance activities.

Other possible indirect impacts to fish species include the introduction of hazardous waste into stream channels through accidental spilling. This risk would be minimized by maintaining refueling areas and hazardous waste storage areas away from stream channels.

Stormwater and erosion and sediment control BMPs and APMs (**Chapter 2, Tables 2.2 and 2.3**) would be used during construction and operation of the Proposed Project including the use of directional boring under all streams with flowing water, silt traps, stream bank stabilization and revegetation of disturbed areas adjacent to perennial streams. Impacts to this species would be less than significant because Special Status Species Significance Criterion 1 (**Section 4.4.2**) would not be exceeded.

Plains Leopard Frog: Impacts to plains leopard frog could include temporary and permanent loss of grassland dispersal habitat and equipment or vehicle collisions along roads in dispersal habitat. Impacts to breeding habitat are not expected because there are only isolated areas of standing or flowing water in the Winner Alternative and these areas would be avoided by placing access roads and turbines in upland areas. Impacts to this species would be less than significant based on the small amount of habitat that would be temporarily or permanently removed and Special Status Species Significance Criterion 1 (**Section 4.4.2**) would not be exceeded.

Lesser Earless Lizard: Impacts to lesser earless lizard could include temporary and permanent loss of habitat and equipment or vehicle collisions along roads within suitable habitat. This species prefers sparsely vegetated areas in short grass ecosystems, including prairie dog towns. Unless heavily grazed, grassland habitats in the Winner Alternative do not support high-quality habitat and the prairie dog town would not be impacted by development of the Proposed Project; therefore, very little habitat would be impacted. Impacts to this species would be less than significant based on the small amount of habitat that would be temporarily or permanently removed, and Special Status Species Significance Criterion 1 (**Section 4.4.2**) would not be exceeded.

Western Box Turtle: Preferred habitat for the western box turtle (lakes, rivers and large streams) would not be impacted by the Proposed Project. Impacts to this species are not anticipated. Therefore, impacts to this species would be less than significant because Special Status Species Significance Criterion 1 (**Section 4.4.2**) would not be exceeded.

Regal Fritillary Butterfly: Regal fritillary butterflies are known to occur five miles south of the Winner Alternative and suitable habitat may be present. Adverse impacts associated with construction include habitat loss and mortality. Habitat loss would be directly proportional to the amount of ground disturbance. Regal fritillary butterflies were not observed during spring or summer avian use surveys, but there has been no survey specifically designed to determine the presence or absence of this species. No studies have evaluated the effects of wind farms on regal fritillary butterflies, and it is difficult to predict the disturbance and displacement effects. General studies of butterfly mortality attributed to turbine strikes indicate that it is likely low due to wind currents generated from turbine rotation (Grealey and Stephenson 2007). Construction activities would temporarily disturb regal fritillary butterflies in the vicinity and could result in habitat loss. Operation could result in collisions with turbines, resulting in injury or death. These impacts would be less than significant because Special Status Species Significance Criterion 1 (**Section 4.4.2**) would not be exceeded.

Western's Proposed Federal Action

If the Proposed Project is approved, development of the Western system modifications at its Winner Substation would not cause the loss of habitat for wildlife species since any changes would be confined to a previously disturbed and graded area. Construction, operation and decommissioning activities could result in the direct mortality of wildlife species if they are not able to move away from equipment and vehicles traveling to the substation. There is a potential for wildlife-electrical equipment interactions during the operation of the proposed substation additions, but it is expected that these interactions would be low. The substation additions would be designed in accordance with the latest APLIC guidelines, and would employ the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**). The effects of any interactions would be less than significant.

4.4.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. There would be no biological resource impacts associated with the No Action Alternative.

4.5 CULTURAL RESOURCES

The Proposed Project must comply with Federal laws relating to identification, management, and protection of cultural resources. Western and RUS assessed the existing previously recorded cultural resource data for the Proposed Project under the requirements, including those in Section 106 of the NHPA and its implementing regulations (36 CFR Part 800). This EIS is not intended to address all of the requirements of Section 106. Because of the extensive nature of the Proposed Project alternatives, Western is conducting Section 106 compliance in accordance with its implementing regulations, 36 CFR 800.4 (b)2, which State:

> (2) Phased identification and evaluation. Where alternatives under consideration consist of corridors or large land areas, or where access to properties is restricted, the agency official may use a phased process to conduct identification and evaluation efforts. The agency official may also defer final identification and evaluation of historic properties if it is specifically provided for in a memorandum of agreement executed pursuant to §800.6, a programmatic agreement executed pursuant to § 800.14 (b), or the documents used by an agency official to comply with the National Environmental Policy Act pursuant to § 800.8. The process

> should establish the likely presence of historic properties within the area of potential effects for each alternative or inaccessible area through background research, consultation and an appropriate level of field investigation, taking into account the number of alternatives under consideration, the magnitude of the undertaking and its likely effects, and the views of the SHPO/THPO and any other consulting parties. As specific aspects or locations of an alternative are refined or access is gained, the agency official shall proceed with the identification and evaluation of historic properties in accordance with paragraphs (b)(1) and (c) of this section.

Resources listed or eligible for listing in the NRHP are defined by the regulations as "historic properties" and impacts to these resources must be considered." In addition, there may be areas of interest to Native Americans, such as traditional use areas or TCPs that extend outside the geographic boundaries of the Proposed Project area. These concerns must be considered through consultation with interested tribes.

4.5.1 METHODS

A Class I cultural resources inventory was completed. The inventory includes a review of existing cultural resources documentation on file in State repositories, a preliminary architectural history windshield survey within the Proposed Project area, and a review of 19th century Public Land Survey maps. Information used in the cultural resources analysis for this EIS includes:

- A Class I survey/records review
- Review of General Land Office maps
- Review of historic atlases
- Review of topography (slope, proximity to water, *etc*.)
- Research on Indian/pioneer/military conflict areas and trails and whether any occur within the Proposed Project alternatives

Areas that typically have a high level of sensitivity include those with the ecological or environmental, ethnohistorical, and historical potential to contain habitation sites and some temporary camps, all cremation and burial sites (and all sites described as containing evidence of human remains), rock art, intaglios, TCPs, and sites of any type that would be eligible to be included on national and State registers. Habitation sites and some temporary camps may hold significant scientific research potential and may also be of traditional cultural significance to Native Americans. Sites with evidence of human remains, rock art, intaglios, and TCPs are of demonstrated significance to Native Americans.

Areas that typically have a moderate level of sensitivity include those with conditions similar to what is described for areas of high sensitivity, but which have been subject to disturbance (such as agricultural activities) or other diminishing conditions; and as a result of these disturbances, the surface expression of the site may be less apparent.

Areas that typically have a low level of sensitivity include those that lack the ecological or environmental, ethnohistorical, and historical potential to contain sites of any type that would be eligible to be included on national and State registers. Isolates and single category sites, such as lithic or ceramic scatters are generally considered to have relatively low sensitivity because of their limited research potential. However, it is acknowledged that even an isolate (for example a Clovis point or a ceremonial object) could be significant to Native Americans and researchers. It should be noted that, when considered alone, many areas with these types of sites may be classified as having low to moderate sensitivity; however, such sites may acquire greater importance when considered part of a district of sites that together contain information relevant to answering important research questions.

4.5.2 SIGNIFICANCE CRITERIA

The threshold of significance for cultural resources is based on whether the resource is listed in, or considered eligible for listing in, the NRHP. There are four criteria under the regulations implementing the NHPA in 36 CFR 60.4 used to evaluate the significance and integrity of a resource. The degree of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (d) that has yielded, or may be likely to yield, information important in prehistory or history.

Within the context of the NHPA, effects to sites are classified as “no adverse effect” or “adverse effect.” Under NEPA, a significant impact to cultural resources would occur if a site of archaeological, tribal, or historical value that is listed or eligible for listing in the NRHP could not be avoided or mitigated during siting and construction of the Proposed Project. In addition, NEPA regulations consider impacts to cultural resources as “direct” or “indirect.” Under the regulations implementing Section 106 of the NHPA, the definition of direct or indirect refers to the APE within which the Federal undertaking may directly or indirectly cause alterations in historic properties (36 CFR 800.16[d]). Therefore, avoidance or mitigation of historic properties can ensure that sites are not adversely impacted (NHPA) and that there are no significant impacts (NEPA).

4.5.3 IMPACT ASSESSMENT

A portion of the Crow Lake Alternative and the majority of the Winner Alternative would be located on rangeland and agricultural lands, where surface cultural resources may have already been disturbed. Earthmoving activities, such as grading and digging, have the highest potential for disturbing or destroying significant cultural resources; however, pedestrian, animal, and vehicular traffic and indirect impacts of earthmoving activities, such as soil erosion, could also have an effect. The construction and decommissioning of the infrastructure necessary for wind-powered facilities has the greatest potential to impact subsurface cultural resources because of the increased ground disturbance during these phases.

Visual impacts to significant historic properties, such as sacred landscapes, historic trails, and structures could also occur. There are four criteria under the regulations implementing the NHPA in 36 CFR 60.4 used to evaluate the significance and integrity of a resource. The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (d) that has yielded, or may be likely to yield, information important in prehistory or history. An adverse visual impact, as it applies to built environments, is generally defined (36 CFR 800) as one that occurs when an undertaking carries the potential to directly or indirectly alter any qualifying characteristic of historic properties either listed or eligible for listing in the NRHP. There is no universally accepted yardstick for measuring visual effects, and since those effects do not always damage the defining characteristics of historic properties in any physical manner, assessing them can be difficult, complicated, and is almost always subjective. Furthermore, because an undertaking would be visible from a historic property does not mean it automatically has created adverse visual effect. A visual impact assessment will be conducted prior to construction.

4.5.3.1 Crow Lake Alternative

Data retrieved from the Class I records review shows that six previously recorded sites are present within the Crow Lake Alternative boundary (see **Table 3.5-2**). Two sites are listed on the NRHP, one is recommended for listing, and one is undetermined (**Table 4.5-1**). One historic foundation (39AU0007) dating to 1861 is recommended eligible for the NRHP by the recording archaeologist with concurrence by the SHPO and Western. The eligibility of one stone circle site (39JE0039) is undetermined. The remaining two historic sites were not recommended eligible by the recording archaeologist. Measures would be taken by the Applicant to ensure that site 39AU0007 is avoided and protected during construction; therefore, no impact would occur. Site 39JE0039 requires additional review to determine eligibility for the NRHP. This site would also be avoided, and therefore, no impact would occur.

One historic structure, the Patten Consolidated School, is listed on the NRHP under Criterion A as a good example of what old county schoolhouses represented to rural communities in South Dakota. The Underwood United Methodist Church is also listed on the NRHP under Criterion C as an example of an early-twentieth century rural wooden country church. An adverse visual effect (NHPA) or visual impact (NEPA) is one that negatively visual effects the integrity to an historic built environment resource, to the extent significance and eligibility for listing in the

NRHP are compromised. In particular, adverse visual effects can be seen as negatively affecting any of the seven characteristics of integrity, to wit: location, design, setting, materials, workmanship, feeling, or association. The Patten Consolidated School is located within the Proposed Project boundary and the Underwood United Methodist Church is located within the one mile buffer.

Table 4.5-1 Crow Lake Alternative Historic Properties

Site	Site Type	NRHP Eligibility	Location
39AU0007	Foundation	Eligible	Within Proposed Project boundary
39JE0039	Stone Circle	Unevaluated	Within Proposed Project boundary
AU00000059	Patten Consolidated School	Eligible – listed Criterion A	Within Proposed Project boundary
AU00000060	Underwood United Methodist Church	Eligible – listed Criterion C	Within one-mile of Proposed Project boundary

The Patten Consolidated School would be evaluated for visual impacts, and avoidance would ensure that no impact would occur, or mitigation of historic properties would ensure a less than significant impact. An indirect impact is an effect that is caused by and results from an activity, although further removed in distance, still reasonably foreseeable. The Underwood United Methodist Church would also be evaluated for secondary or indirect visual impacts. Avoidance would ensure that no impact would occur, or mitigation of historic properties would ensure that there is a less than significant impact.

Prior to construction, a complete pedestrian survey of the entire APE for cultural resources would be completed. A qualitative approach has been developed that incorporated factors that are strong predictors of cultural resources, including climatic zone, slope, access, and water sources to predict site types and densities. The areas are rated as high, moderate or low sensitivity.

In the Crow Lake Alternative, the landscape is characterized by hilly terrain, intermittent and perennial lakes and ponds associated with prairie potholes and intermittent streams. Given the tribes' repeated use of the area between the Missouri River and the James River as hunting grounds, historic period settlements and villages, and military excursions and mapping expeditions to find roads and routes from the east to the Missouri, it is expected that site sensitivity in certain areas of the Proposed Project area would be high:

- Agricultural Lands: **Low to Moderate**. This rating is primarily due to generations of disturbance from agricultural activities. However, subsurface archaeological sites may be encountered during ground-disturbing activities. Application of cultural resources mitigation measures (to be identified), BMPs and APMs (as listed in **Chapter 2, Tables 2.2 and 2.3**) would ensure that less than significant impacts would occur if subsurface sites are encountered during construction.

- Prairie Lands: **High**. The portion of the Crow Lake Alternative that is characterized as Prairie Lands has extensive prehistoric and historic use by tribes, traders, explorers, settlers, and the military that was instrumental, not only in the broad pattern of United States military, transportation, and commerce history, but world history in terms of the early trade industry. This site was also important in the political/economic struggle for control of North America, as well as for the history and prehistory of the tribal people of the Central Plains. The Applicants would make a reasonable effort to design the Proposed Project to avoid NRHP-eligible properties. If a NRHP-eligible property could not be avoided, then application of cultural resources mitigation measures (to be identified) would ensure that less than significant impacts would occur. If unknown subsurface archaeological sites are encountered during construction, application of cultural resources mitigation measures (to be identified), BMPs and APMs (as listed in **Chapter 2, Tables 2.2 and 2.3**) would ensure that less than significant impacts would occur.

4.5.3.2 Winner Alternative

Thirteen previously recorded sites are present within the Winner Alternative (see **Table 3.5-5**), six of which have undetermined NPHP eligibility (**Table 4.5-2**). They include one historic cairn (39TP0019), the North East Washington Rural School foundation with privy depressions (39TP0027), three farmsteads (39TP0026, 39TP0035, 39TP0036), and a concrete barn foundation (39TP0038). The remaining six sites were not recommended eligible for the NRHP by the recording archaeologist; the SHPO and Western concurred with this recommendation. The six unevaluated historic properties require additional review to determine eligibility for the NRHP. In the event these historic properties are determined eligible, avoidance would ensure that no impact would occur, or application of mitigation measures (to be identified), BMPs and APMs (as listed in **Chapter 2, Tables 2.2 and 2.3**) would ensure that less than significant impacts would occur.

One historic structure within the Winner Alternative, the Manthey Barn, is listed on the NRHP under Criterion C as an example of a variation of the Midwest Three-Portal Barn in South Dakota. The Manthey Barn would be evaluated for visual impacts and avoidance would ensure that there is no impact, or mitigation of historic properties would ensure a less than significant impact.

Six additional historic structures that are listed or recommended eligible for the NRHP are located within one mile of the Winner Alternative and include the Key Residence, the Winner Post Office, Winner Drive-In, Immaculate Conception Church, St. Mary's Parish Hall, and the Winner Grade School (**Table 4.5-3**). The Key Residence is listed on the NRHP under Criterion C as an example of an early concrete residential structure and as one of the first residences erected in Winner. The Winner Grade School is recommended eligible for the NRHP by the recording archaeologist and concurrence with the SHPO and Western under Criterion C as an example of the style developed by Harold Spitznagel and used in several communities in South Dakota during the 1950s and may also be eligible as an example of the building boom in Winner following WWII. The Winner Post Office is recommended eligible for the NRHP by the recording archaeologist and concurrence with the SHPO and Western under Criterion C. The Winner Drive-In, Immaculate Conception Church, and St. Mary's Parish Hall are all recommended eligible for the NRHP by the recording archaeologist and concurrence with the SHPO and Western under Criterion C for their association with post-war (WWII) era building development. In addition, the Immaculate Conception Church may retain sufficient integrity to be eligible for its architecture. These structures would also be evaluated for indirect visual impacts. Avoidance would ensure that no impact would occur, or application of mitigation measures (to be identified), BMPs and APMs (as listed in **Chapter 2, Tables 2.2 and 2.3**) would ensure that less than significant would occur.

A pedestrian survey of sites within the Winner Alternative is not available, so a qualitative approach that incorporated factors that are strong predictors of cultural resources, including climatic zone, slope, access, and water sources was used to predict site types and densities. The rating system that was used refers to each site as high, moderate or low sensitivity.

The Winner Alternative landscape is characterized by rolling plains of relatively low relief that give way to butte and mesa topography that is typical of the high plains with intermittent streams throughout the Winner Alternative area. The area has been used extensively as hunting grounds for the Sioux tribes, as well as for military excursions. It is expected that site sensitivity in certain areas of this Proposed Project area would be low to moderate.

The low rating is primarily due to the generations of disturbance from agricultural activities since the majority of the Winner Alternative is within agricultural fields. However, subsurface archaeological sites may be encountered during ground disturbing activities. If subsurface sites are encountered during construction, application of cultural resources mitigation measures (to be identified), BMPs and APMs (as listed in **Chapter 2, Tables 2.2 and 2.3**) would ensure that less than significant impacts would occur.

Table 4.5-2 Winner Alternative Historic Properties

Site	Site Type	NRHP Eligibility	Location
39TP0019	Cairn	Unevaluated	Within Proposed Project boundary
39TP0026	Farmstead	Unevaluated	Within one-mile of Proposed Project boundary
39TP0027	School Foundation	Unevaluated	Within Proposed Project boundary
39TP0035	Farmstead	Unevaluated	Within Proposed Project boundary
39TP0036	Farmstead	Unevaluated	Within Proposed Project boundary
39TP0038	Foundation	Unevaluated	Within Proposed Project boundary

Table 4.5-3 Winner Alternative Historic Structures

Site	Site Type	NRHP Eligibility	Location
TP00000010	Manthey Barn	Eligible – Listed Criterion C	Within Proposed Project boundary
TP00000001	Key Residence	Eligible – Listed Criterion C	Within one-mile of Proposed Project boundary
TP00000002	Winner Post Office	Eligible – Criterion C	Within one-mile of Proposed Project boundary
TP00000065	Winner Drive-In	Eligible – Criterion C	Within one-mile of Proposed Project boundary
TP00000066	Immaculate Conception Church	Eligible – Criterion C	Within one-mile of Proposed Project boundary
TP00000069	St. Mary's Parish Hall	Eligible – Criterion C	Within one-mile of Proposed Project boundary
TP00000071	Winner Grade School	Eligible – Criterion C	Within one-mile of Proposed Project boundary

The moderate rating is primarily due to the Winner Alternative’s proximity to archaeological regions such as the Fort Randall Archaeological Region. The 39-mile archaeological region that encompasses Fort Randall is less than two miles east of the Winner Alternative, but military excursions may have extended beyond that boundary and further into the Plains. Other archaeological regions that contribute to a higher rating include the Lower White and Sand Hills. The Sand Hills Archaeological Region is located primarily in Nebraska but also extends into south central South Dakota and into the Winner Alternative. These sites are often buried and located along streams and rivers. The Winner Alternative is within the Tertiary tablelands, also known as the Sand Hills; limited archaeological work has been done in the South Dakota area of the Sand Hills Archaeological Region. Since the majority of sites found in the Sand Hills Archaeological Region tend to be buried sites, the likelihood of finding sites is low, but would be more likely to be encountered during construction. This does not preclude displaced surface sites that may be encountered within agricultural fields where artifacts have been turned up from plowing activities, or sites along creeks, drainages, and cutbanks. The possibility of these types of sites was discussed with the Rosebud Sioux Tribe at the conclusion of their records search; they have not had access to the area since it was removed from reservation status in the early 1900s (**Appendix D**).

In the event that NRHP-eligible properties are encountered the Applicants would make a reasonable effort to design the Proposed Project to avoid the eligible properties. If a NRHP-eligible property could not be avoided, then the application of cultural resources mitigation measures (to be identified), BMPs and APMs (as listed in **Chapter 2, Tables 2.2 and 2.3**) would ensure that less than significant impacts would occur. If unknown subsurface archaeological sites are encountered during construction, application of cultural resources mitigation measures (to be identified), BMPs and APMs (as listed in **Chapter 2, Tables 2.2 and 2.3**) would ensure that less than significant impacts would occur.

4.5.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. There would be no cultural resources impacts associated with the No Action Alternative.

4.6 LAND USE

4.6.1 METHODS

The ROI for land use includes areas of immediate disturbance associated with the Proposed Project and the proposed Federal actions. Additionally, adjacent land uses have been considered. Analyses completed for this section evaluate environmental impacts as a result of the Proposed Project Components and the proposed Federal actions. Land use plans for Aurora and Brule counties are currently being revised. Jerauld County's Comprehensive Plan was approved in 1998. No land use plan is available for Tripp County. Reviews of aerial photographs, existing public inventories (*e.g.*, USFWS, NWI, NRCS databases), and field studies have been used to identify the land uses within the alternatives.

The evaluation of impacts to land uses considered potential impacts to existing productive uses of the land, such as agriculture, rangeland and preservation of natural environments, as well as prime farmland and farmland of statewide importance, residential uses and recreational opportunities as a result of the Proposed Project and the proposed Federal actions.

4.6.2 SIGNIFICANCE CRITERIA

A significant impact to land use would occur if:

- An activity would conflict with any applicable land use policy or regulation of an agency with jurisdiction over those areas

4.6.3 IMPACT ASSESSMENT

For either alternative, the Proposed Project and proposed Federal actions would not conflict with any applicable policy or regulation of an agency with jurisdiction in the area. The majority of the area is used for rangeland and agriculture. Current land uses would continue, even though some land would be converted to industrial use. Additionally, the Applicants have coordinated with landowners and are establishing lease agreements for the Proposed Project development. Additionally, BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**) would be employed. Impacts to land use would be less than significant.

4.6.3.1 Crow Lake Alternative

Development of the Crow Lake Alternative would result in approximately 12 acres of temporary impact and approximately 1.8 acres of permanent impact to prime farmlands, and approximately 976 acres of temporary impact and approximately 99 acres of permanent impact to farmland of statewide importance. Temporary impacts due to construction would be revegetated with native grasses and/or crops matching the surrounding agriculture landscape. The permanent impacts account for less than 0.5 percent of available respective farmland within the Crow Lake Alternative boundary. In addition, there is a small area of prime farmland, if irrigated, that would be impacted by the Proposed Project; however, the land is not being used for agricultural purposes, and therefore would not result in a reduction in active agriculture. It would not substantially alter the use of farmland in areas designated for turbine and access road installations. The FPPA does not authorize the Federal government to affect the property rights of private landowners or regulate the use of private land, so conversion of some prime farmland and farmland of statewide importance to different uses would not conflict with FPPA policy.

The Crow Lake Alternative would result in the temporary disturbance of 82 acres and the permanent disturbance of 11 acres within USFWS grassland easements. It would also result in the temporary disturbance of 140 acres and the permanent disturbance of 9 acres within USFWS wetland easements (additional biological information pertaining to USFWS easements can be found in **Section 4.4**). The Applicants would work with the USFWS to obtain permits for the impact. The Proposed Project would not conflict with current USFWS land uses and policies for wetland and grassland easements.

During construction and decommissioning, noise, dust, traffic and the presence of a construction force would temporarily affect the rural to primitive character of the area. No residences are within 1,000 feet of the proposed turbine locations, in accordance with the Applicants' siting parameters. Further, the minimum distance from the centerlines of the alternative transmission line corridors to the nearest residence is at least 1,900 feet, so residential use would not be affected.

People engaging in casual hiking, birding and hunting within the Proposed Project alternative ROIs could be temporarily affected during the construction and decommissioning activities due to limited access.

If the Proposed Project is approved, system modifications at Western's Wessington Springs Substation would be confined within the existing substation and not alter current uses for the site.

4.6.3.2 Winner Alternative

Development of the Winner Alternative would result in approximately 2.1 acres of temporary impact and approximately 0.2 acres of permanent impact to prime farmlands, and approximately 509 acres of temporary impact and approximately 59 acres of permanent impact to farmland of statewide importance. Temporary impacts due to construction of the Proposed Project would be revegetated with native grasses and crops matching the surrounding agriculture landscape. The permanent impacts account for less than 0.5 percent of available respective farmland within the Winner Alternative boundary. In addition, there is a small acreage of prime farmland, if irrigated, that would be impacted by the Proposed Project; however, the land is not being used for agricultural purposes and therefore would not result in a reduction in active agriculture.

Additionally, the Winner Alternative would not result in temporary or permanent disturbance within USFWS grassland easements.

During construction and decommissioning, noise, dust, traffic and the presence of a construction force would temporarily affect the rural to primitive character of the area. One residence is located within approximately 800 feet from a proposed turbine location. It is anticipated that this turbine location would be eliminated from further consideration, because it does not meet the Applicants' siting criteria. The second nearest residence is 1,050 feet away from a proposed turbine location, and meets the Applicants' siting criteria.

The closest residence to the centerline of the alternative 1 transmission line corridor is approximately 100 feet away, and due to this proximity, does not meet the Applicants' line siting criteria. It is anticipated that the alternative 1 transmission line corridor would be eliminated from further consideration. The closest residence to centerline of the alternative 2 transmission line corridor is at least 900 feet away, and meets the Applicants' siting criteria. Impacts associated with the short-term construction of the transmission corridor would be minimized through the included BMPs and APMs as described in **Chapter 2, Tables 2.2 and 2.3**.

Similar to the Crow Lake Alternative, people engaging in casual hiking, birding and hunting could be temporarily affected during the construction and decommissioning activities due to limited access.

If the Proposed Project is approved, system modifications at Western's Winner Substation would not alter current uses for the site. All additions would be confined within or adjacent to the existing substation.

4.6.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. Local landowners would not receive lease payments from the Applicants and could sign leases with another wind power developer. There would be no land use impacts associated with the No Action Alternative.

4.7 TRANSPORTATION

4.7.1 METHODS

The ROI for roads and highways includes roads near the Proposed Project area that would be used for delivery of construction equipment, construction worker access and maintenance access. The impact analysis only includes roads and highways within the counties in which the site would be located. The ROI for aviation includes airports within 20 miles. Additionally, information has been reviewed from the Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM Administered Lands in the Western United States (Bureau of Land Management [BLM] 2005).

4.7.2 SIGNIFICANCE CRITERIA

A significant impact to transportation would occur if:

- An activity would result in the permanent disruption of regional and local traffic
- An activity would result in the destruction of existing transportation infrastructure
- An activity would result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks; or impact an FAA-designated air safety zone around an existing airport

4.7.3 IMPACT ASSESSMENT

In general, a variety of transportation operations are necessary to support wind energy development. A list of representative transportation requirements for each phase of development is provided below. Most of these requirements would involve the transportation of material and equipment necessary for the Proposed Project and the proposed Federal actions.

Roads and Highways

<u>Construction</u>

The construction and operation of the Proposed Project would result in an increase in the ADT on the respective roadway network surrounding the Proposed Project alternatives. The majority of the additional traffic would be during the initial construction phase.

- Site and road grading and preparation would require heavy earthmoving equipment, typically involving 10 to 40 pieces of heavy machinery
- Road, pad and staging areas would require sand or gravel, delivered by dump trucks
- Tower foundations would require concrete, aggregate, sand and cement to be delivered by dump trucks; typically 15 to 35 truck shipments per foundation
- Tens of thousands of gallons per day of water typically would be obtained locally in the Proposed Project area that may require a State specific appropriation permit

- Turbines would be brought to the site by specialized equipment; overweight and/or oversized loads may require State and county specific permits and traffic management
- Turbine assembly and installation would require specialized cranes; overweight and/or oversized loads may require State and county specific permits and traffic management
- Turbine interconnections and transmission lines would require trenching or auger equipment and line trucks

Construction hours are expected to be from 6:00 a.m. to 6:00 p.m. on weekdays, and possibly weekends. Some activities may require extended construction hours, and nighttime construction may be necessary to meet the overall schedule. The movement of equipment and materials to the Proposed Project alternatives would cause a relatively short-term increase in the level of service of local roadways during the construction period. Most equipment (*e.g.*, heavy earthmoving equipment and cranes) would remain at the site for the duration of construction. Shipments of materials, such as gravel, concrete and water, would not be expected to substantially affect local primary and secondary road networks.

Shipments of overweight and/or oversized loads could be expected to cause temporary disruptions on the secondary and primary roads used to access a construction site. The transport vehicles may require defined routes, and by obtaining necessary permits for hauling heavy loads would comply with all Federal, State and local rules and ordinances. Local roads might require fortification of bridges and removal of obstructions to accommodate overweight or oversized shipments. The need for such actions would be determined on a site-specific basis. Access roads may need to be upgraded or constructed to accommodate overweight or oversize shipments. Because of the anticipated weight of the turbine components and electrical transformers that would be brought to the site, maximum grade becomes a critical road design parameter.

<u>Operation</u>

Once the Proposed Project is in operation, the expected traffic would be minimal. Minimal support personnel would be needed to maintain and operate the facility. Normally, no heavy or large loads would be expected; pickup or medium-duty trucks would be used for daily operations. Turbine site locations may be attended during business hours by a small maintenance crew of 10 to 12 people that would work in teams of two. Consequently, transportation activities would be limited to about 12 trips from the maintenance building to turbines in a typical day, using pickup trucks, medium-duty vehicles or personal vehicles. Large components may be required for equipment replacement in the event of a major mechanical breakdown. However, such shipments would be expected to be infrequent. Transportation activities during operations would be minimal, similar to those currently occurring, and not be expected to cause noticeable impacts to local road networks.

<u>Decommissioning</u>

Most transportation activities during site decommissioning would be similar to those during site development and construction.

- Foundation removal, site regrading and recontouring would require heavy earthmoving equipment transported to the site using flatbed or goose-neck trailers
- Turbine and tower disassembly would require cranes; overweight and/or oversized loads may require State-specific permits and traffic management
- Equipment and debris removal would require medium- to heavy-duty trucks

Heavy equipment and cranes would be required for turbine and tower dismantlement, breaking up tower foundations, and regrading and recontouring the site to the original grade. With the possible exception of a main crane, oversized and/or overweight shipments are not expected during decommissioning activities because the major turbine components could be disassembled, segmented or size-reduced prior to shipment. Thus, potential disruptions to local traffic during decommissioning would likely be fewer than those during original construction activities; therefore, decommissioning impacts would be less than significant.

Short-term traffic congestion may exist when construction delivery vehicles are on the road, and localized increases in road wear and maintenance may occur. However, the construction, operation and decommissioning of the Proposed Project would result in less than significant impacts to permanent, regional and local traffic and transportation infrastructure through the implementation of traffic control measures and other standard construction practices described above.

Aviation

The FAA regulates obstructions to navigable airspace (14 CFR 77, or “FAA Part 77”). The Applicants are required to notify the FAA Administrator of any proposed construction “of facilities more than 200 feet in height above the ground level at its site” (Section 77.13[a][1]). The height of towers and length of blades have a combined height of approximately 389 feet, exceeding the FAA notice threshold. The Applicants have provided preliminary information to the FAA regarding the Proposed Project. Prior to construction, the Applicants would notify the FAA regarding exact facility heights and latitude and longitude coordinates.

FAA requires that aircraft warning lights be installed on turbines taller than 200 feet. Recently, the FAA drafted new recommendations for lighting of wind-powered facilities. Based on studies prompted by the American Wind Energy Association and DOE, the FAA has developed a new set of recommendations for lighting wind farms that would require fewer lights than needed under its current policy. The new recommendations suggest red or white synchronized flashing strobe lights, at most 0.5 mile apart around the perimeter of wind farms. Daytime lighting and dual lighting of the turbines were both deemed unnecessary. However, the USFWS discourages the use of red flashing lights due to wildlife impacts (USFWS 2003). Prior to construction, the Applicants would consult with the FAA to identify applicable lighting requirements.

4.7.3.1 Crow Lake Alternative

Roads and Highways

The heavy equipment and materials needed for site access, site preparation and foundation construction are typical of heavy construction projects and do not pose unique transportation considerations. Construction, operation and decommissioning of the Proposed Project Components would not result in a permanent disruption of regional and local traffic, nor would these activities result in the destruction of existing transportation infrastructure; therefore development of the Proposed Project Components would result in less than significant impacts.

Aviation

The Proposed Project would not impact an FAA-designated air safety zone, nor would it result in a change in air traffic patterns, an increase in traffic levels or a change in location that results in substantial safety risks. Therefore, with the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), the construction, operation and decommissioning of the Proposed Project would result in less than significant impacts to aviation.

If the Proposed Project is approved, Western's system modifications at its Wessington Springs Substation would require personnel and shipments of materials, such as electrical equipment, gravel, concrete and water. Such shipments would similarly be expected to result in less than significant impacts to transportation.

4.7.3.2 Winner Alternative

Transportation impacts associated with the Winner Alternative would be similar to those described for the Crow Lake Alternative because the Proposed Project design requirements are comparable despite the alternative selected; therefore, with the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), impacts would be less than significant.

Shipments to Western's Winner Substation would similarly be expected to result in less than significant impacts.

4.7.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. There would be no transportation impacts associated with the No Action Alternative.

4.8 VISUAL RESOURCES

4.8.1 METHODS

The ROI includes areas within and adjacent to the Proposed Project area from which a person may be able to observe changes to the visual landscape resulting from constructing the Proposed Project Components. In addition, the ROI includes residences within the alternative boundaries, nearby population centers and nearby roadways from which the Proposed Project Components may be viewed if built. The impact analysis for visual resources evaluates the visual quality of the existing setting, assesses the sensitivity of visual resources, and evaluates modifications that would occur as a result of the Proposed Project. The following aesthetic values have been considered when evaluating the visual quality of, and modifications to, the existing landscape:

- Form – topographical variation, mountains, valleys
- Line/Pattern – roads, transmission lines
- Color/Contrast – brightness, diversity
- Texture – vegetation, buildings, disturbed areas

The sensitivity of the existing visual resources to changes associated with the Proposed Project and proposed Federal actions are based on a number of factors:

- The extent to which the existing landscape is already altered from its natural condition.
- The number of people within visual range of the area, including residents, highway travelers, and those involved in recreational activities.
- The degree of public concern or agency management directives for the quality of the landscape.

KOPs were selected to depict viewpoints that would be visually sensitive to change as a result of the Proposed Project. The KOPs depict the general visual setting of each of the alternatives and provide a baseline for developing visual simulations. As described in **Section 3.8.2**, based on public input received during the EIS scoping process, local (*i.e.,* residents within and near the alternative boundaries) sensitivity to visual changes as a result of the Proposed Project is low. The LCTDR and LCIC were identified as sensitive viewpoints for the Proposed Project; therefore, KOPs were selected for each of the alternatives based on topography and the potential to view the Proposed Project from the LCTDR and LCIC, as depicted in **Figure 3.8-1**. Visual simulations were prepared for each of the KOPs using computer software that considered the elevation, topography and distance from the viewpoint to the visible Proposed Project Components. Proposed Project Components have been labeled in the simulations in which they would be visible. If the simulation has determined that the Proposed Project Components would not be visible, then there is no additional label on the photograph. The existing condition photographs from **Section 3.8** are repeated in this section for side-by-side comparison between the existing condition and the simulation.

4.8.2 SIGNIFICANCE CRITERIA

A significant impact to visual resources would occur if:

- An activity would permanently and substantially alter or degrade scenic resources, including, but not limited to, geologic and topographic features, major stands of vegetation and/or trees, and other visual resources within a State scenic highway
- An activity would substantially degrade the existing visual character or quality of the Proposed Project site and its surroundings

4.8.3 IMPACT ASSESSMENT

For visual resource analysis, the following impact assessment applies to both alternatives. The KOP analysis is separated for each alternative into **Sections 4.8.3.1** and **4.8.3.2** below. Additionally, potential impacts to historic property settings would be addressed through the NHPA, Section 106 process.

Aboveground facilities would consist of up to 101 turbines, access roads, overhead electric transmission lines and a new collection substation. The most visible component of the Proposed Project would be the addition of the turbines to the landscape. Impacts to visual resources from the construction, operation and decommissioning of a wind-powered facility in a rural, agricultural area would occur by altering the physical setting and visual quality of the existing landscape and by effects on the landscape as experienced from sensitive viewpoints, including residential areas and travel routes. The proposed turbines would introduce new or different elements into the landscape and would alter the existing form, line, color and texture that characterize the existing landscape. To avoid or minimize visual impacts, all wind turbines would be uniform in design and color throughout the area. The neutral color of the turbines would minimize contrast against the sky. The turbines would be visible at greater distances on clear days with blue skies compared with cloudy, overcast skies when the neutral turbines have a greater ability to blend with the background. All KOP photographs were taken on clear sky days so that the simulations would represent the conditions of greatest potential contrast between the turbines and landscape. The low-reflectivity finish of the turbines would minimize reflection and glare.

Flickering shadows could be cast by moving rotors. Flickering is the result of alternating changes in light intensity caused by the moving blade casting shadows on the ground and stationary objects, such as a window at a residence. Flickering would be limited to daylight hours when the sun is shining, would be noticeable only in the immediate area, and would vary throughout the day and by season. Flickering shadows would be greatest or longest – up to approximately 1,000 feet – at sunrise and sunset when the sun is shining and shadows are at their longest (WIND Engineers 2003). The uppermost portion of the turbine blades would stand approximately 389 feet above the ground surface. The visual character of the area would be altered from minimally developed agricultural land use to somewhat industrial. Some of the turbines would require lights on top of the nacelle, for aircraft safety, potentially changing the view from nearby rural residences and roadways. Turbines would not be sited near trees or cause trees to be removed. The regional landscape is generally uniform, does not contain highly distinctive or important landscape features, is not densely populated or used, and the local residents' sensitivity to visual changes associated with the Proposed Project is low; therefore, impacts to the existing visual character or quality within either of the alternatives from development of the Proposed Project would be less than significant.

If the Proposed Project is approved, system modifications at either of Western's substations would be confined within or adjacent to the existing substation, so system additions would not introduce new or different elements into the landscape, or substantially alter the characteristics of the existing landscape.

4.8.3.1 Crow Lake Alternative KOPs

Figures 4.8-1 and **4.8-2** depict the existing condition and visual simulation, respectively, from KOP 1. KOP 1 is one of the highest elevations on the LCTDR from which the Proposed Project may be viewed. The nearest turbine to KOP 1 would be approximately 22 miles away and, as demonstrated by the visual simulation, Proposed Project Components would not be visible in the existing landscape (see **Figure 4.8-2**).

Figures 4.8-3 and **4.8-4** depict the existing condition and visual simulation, respectively, from KOP 2. KOP 2 is the view from the LCIC. The nearest turbine to KOP 2 would be approximately 24 miles away and, as demonstrated by the visual simulation, Proposed Project Components would not be visible in the existing landscape (see **Figure 4.8-4**).

Figures 4.8-5 and **4.8-6** depict the existing condition and visual simulation, respectively, from KOP 3. KOP 3 is the nearest location on the LCTDR from which the Proposed Project may be viewed. The nearest turbine to KOP 3 would be approximately 17 miles away and would be barely perceptible on the horizon within the existing landscape (see **Figure 4.8-6**). The turbines (labeled on the simulation) would be a minimal addition to the existing landscape, but would be indistinguishable from the existing transmission line structures.

As illustrated by the photographic simulations, development of the Proposed Project would not substantially alter or degrade scenic resources and would not substantially degrade the visual quality of the Crow Lake Alternative as viewed from the LCTDR or LCIC; therefore, impacts to visual resources would be less than significant.

Figure 4.8-1 KOP 1 Existing Condition

Figure 4.8-2 KOP 1 Simulation

Figure 4.8-3 KOP 2 Existing Condition

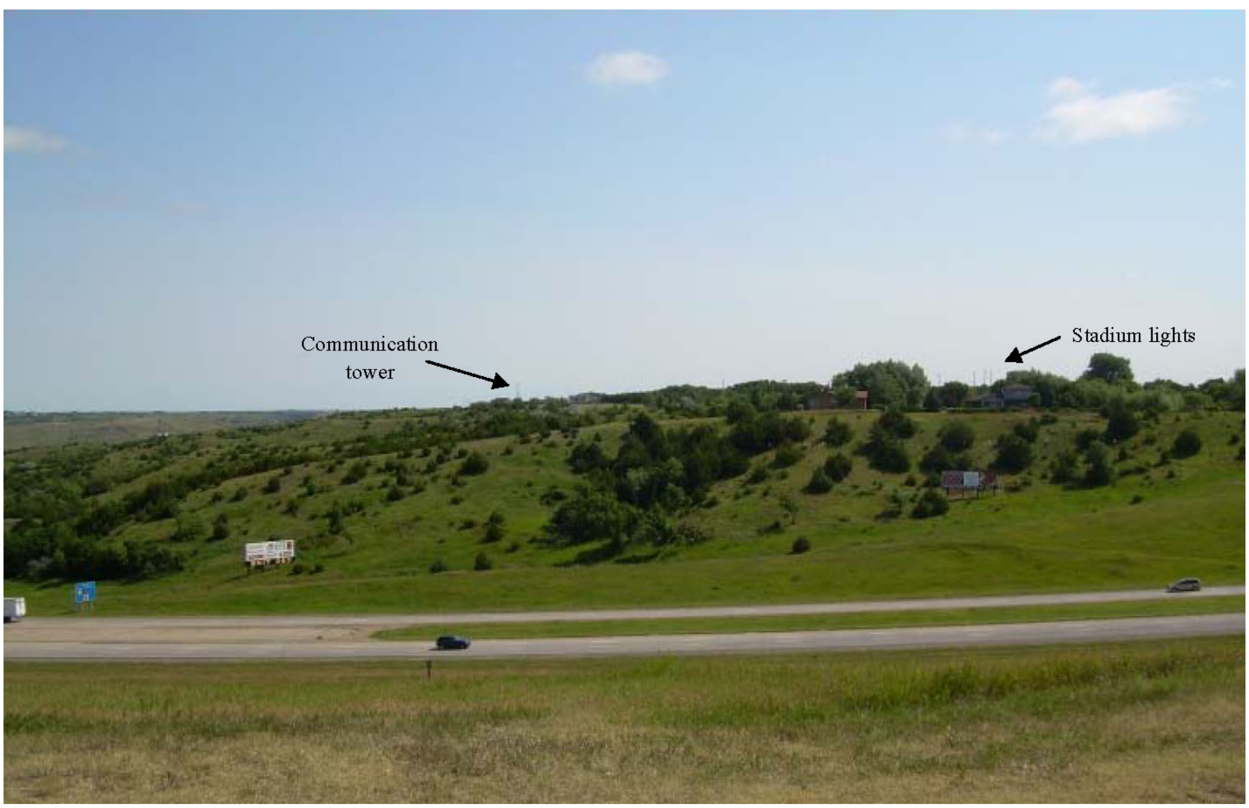


Figure 4.8-4 KOP 2 Simulation

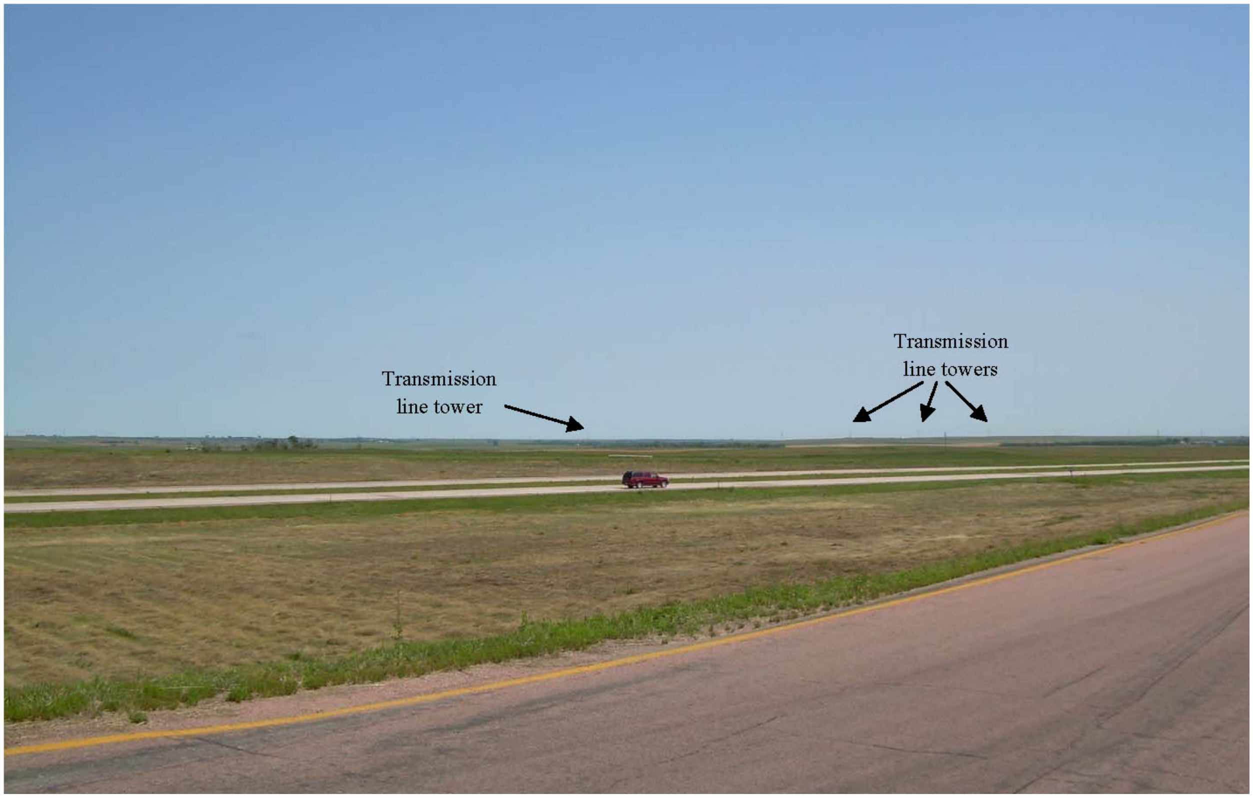


Figure 4.8-5 KOP 3 Existing Condition

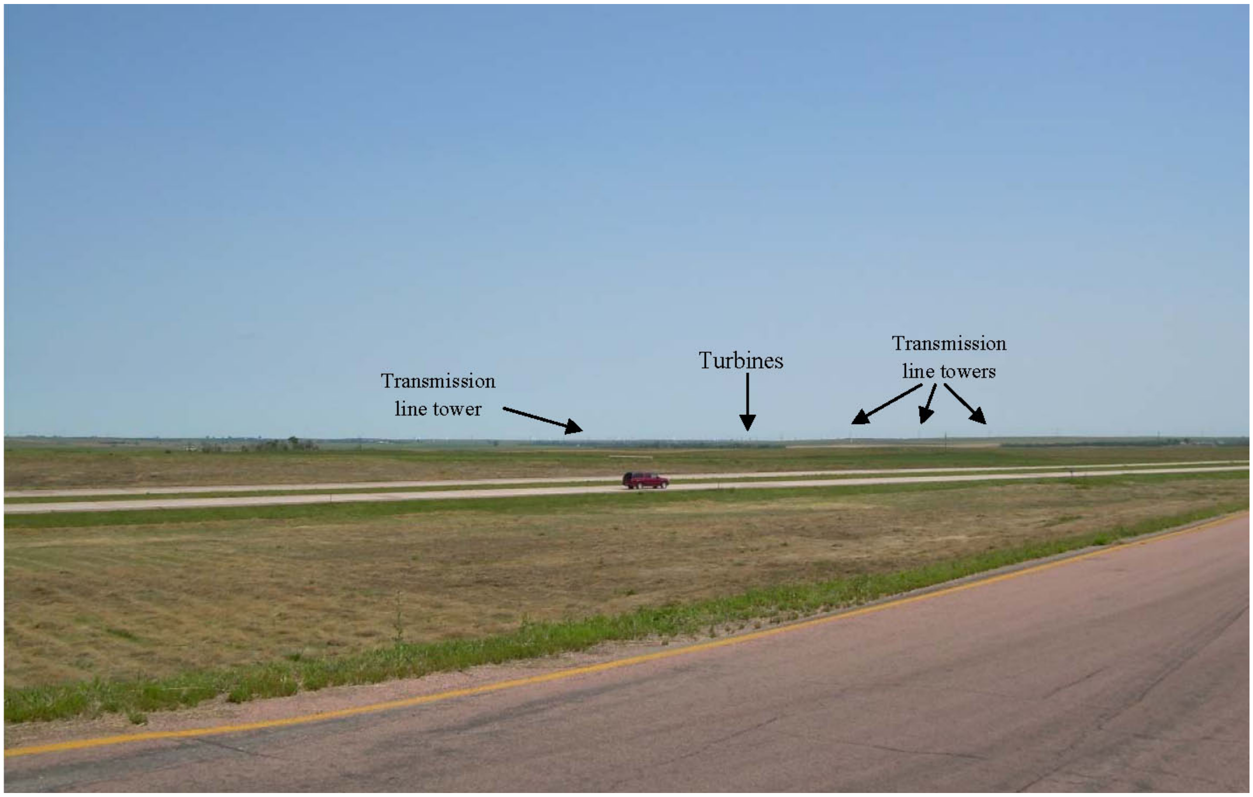


Figure 4.8-6 KOP 3 Visual Simulation

4.8.3.2 Winner Alternative KOPs

Figures 4.8-7 and **4.8-8** depict the existing condition and visual simulation, respectively, from KOP 4. KOP 4 is near the intersection of SR44 and SR47. The nearest turbine (labeled on the simulation) within the KOP 4 field of view would be approximately 22 miles away and would be nearly imperceptible on the horizon within the existing landscape (see **Figure 4.8-8**).

Figures 4.8-9 and **4.8-10** depict the existing condition and visual simulation, respectively, from KOP 5. KOP 5 provides another viewing angle from near the intersection of SR44 and SR47. The nearest turbine (labeled on the simulation) within the KOP 5 field of view would be approximately 15 miles away and would be nearly imperceptible on the horizon within the existing landscape (see **Figure 4.8-10**).

Figures 4.8-11 and **4.8-12** depict the existing condition and visual simulation, respectively, from KOP 6. KOP 6 is one of the highest elevations on the LCTDR from which the Proposed Project may be viewed. The nearest turbine to KOP 6 would be approximately 19.5 miles away and, as demonstrated by the visual simulation, Proposed Project Components would not be visible in the existing landscape (see **Figure 4.8-12**).

Figures 4.8-13 and **4.8-14** depict the existing condition and visual simulation, respectively, from KOP 7. KOP 7 is the nearest location on the LCTDR from which the Proposed Project may be viewed. The nearest turbine to KOP 7 would be approximately 8.4 miles away and would be barely perceptible on the horizon within the existing landscape (see **Figure 4.8-14**). The turbines (labeled on the simulation) would be a minimal addition to the existing landscape, but would draw less attention than the existing roadway and water tower.

As illustrated by the photographic simulations, development of the Proposed Project would not substantially alter or degrade scenic resources and would not substantially degrade the visual quality of the Winner Alternative as viewed from the LCTDR or LCIC; therefore, impacts to visual resources would be less than significant.

Figure 4.8-7 KOP 4 Existing Condition

Figure 4.8-8 KOP 4 Simulation

Figure 4.8-9 KOP 5 Existing Condition

Figure 4.8-10 KOP 5 Simulation

Figure 4.8-11 KOP 6 Existing Condition

Figure 4.8-12 KOP 6 Simulation

Figure 4.8-13 KOP 7 Existing Condition

Figure 4.8-14 KOP 7 Simulation

4.8.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. There would be no visual resource impacts associated with the No Action Alternative.

4.9 NOISE

4.9.1 METHODS

The ROI for noise includes residences located within the Proposed Project alternatives and residences adjacent to the areas of the proposed Federal actions. Examples of construction and decommissioning related noise-emitting sources include heavy equipment used in earthmoving, foundation preparation and demolition, structure assembly and other activities. Operational noise-emitting sources include the wind turbines, as well as the low, continuous vibrational hum which can be heard from the completed transmission lines and facilities.

As described in **Section 3.9**, dBA represents the human hearing response to sound for a single sound event. In 1974, the EPA identified safe noise levels that could be used to protect public health and welfare, including prevention of hearing damage, sleep disturbance and communication disruption. Outdoor L_{dn} values of 55 dBA were identified as desirable to protect against activity interference in residential areas. When annual averages of the daily level are considered over a period of 40 years, the EPA identified average noise levels equal to or less than 70 dBA as the level of environmental noise that would prevent any measurable hearing loss over the course of a lifetime. Low-frequency sound is discussed in **Section 4.12**.

<u>Construction</u>

Construction noise levels associated with a wind farm vary greatly depending on equipment, operation schedule and condition of the area being worked (BLM 2005). **Table 4.9-1** identifies noise levels for typical construction equipment.

<u>Operation</u>

Table 4.9-2 provides a comparison of wind turbine noise to other noise sources.

The Wessington Springs Wind Project located in Jerauld County, South Dakota, modeled operational noise impacts associated with the same make and model wind turbine as identified for the Proposed Project. Based on these results, the anticipated noise level at the base of the wind turbine would be 55 dBA and would be between 50 dBA and 45 dBA at a distance between 660 feet and 1,320 feet from the wind turbine (Western 2007). As a conservative approach, noise levels would be reduced for receptors further removed from the noise source by approximately 6 dBA for each doubling of distance from the source (Harris 1991).

Table 4.9-1 Noise Levels at Various Distances from Typical Construction Equipment

Construction Equipment	Noise Level $L_{eq(1\text{-}h)}$[a] at Distances [dBA]					
	50 ft	250 ft	500 ft	1,000 ft	2,500 ft	5,000 ft
Bulldozer	85	71	65	59	51	45
Concrete mixer	85	71	65	59	51	45
Concrete pump	82	68	62	56	48	42
Crane, derrick	88	74	68	62	54	48
Crane, mobile	83	69	63	57	49	43
Front-end loader	85	71	65	59	51	45
Generator	81	67	61	55	47	41
Grader	85	71	65	59	51	45
Shovel	82	72	62	56	48	42
Truck	88	74	68	62	54	48

Source: Harris Miller Miller & Hanson, Inc. 1995 and BLM 2005

[a] $L_{eq(1\text{-}h)}$ is the equivalent steady-State sound level that contains the same varying sound level during a 1-hour period.

Table 4.9-2 Comparison of Wind Turbine Noise to Other Noise Sources

Noise Source	Typical dBA
Threshold of pain	140
Fire engine siren at 100 feet	130
Flyover of an F-16 aircraft at 500 feet	104
Average street traffic	85
Vacuum cleaner	70
Normal conversation	55
Large wind turbine at base of tower	**55**
Soft music, moderate rainfall	50
Background noise in a rural environment	48
Typical living room	40
Large wind turbine from 0.25 mile	**35**
Whisper, quiet library	35
Rustling leaves	20
Threshold of hearing	0

Source: Western 2007

Decommissioning

The decommissioning phase of the Proposed Project would be anticipated to require similar types of activities and generate similar noise levels as described in construction.

4.9.2 SIGNIFICANCE CRITERIA

The impact analysis for noise is based on the following significance criteria. A significant impact to noise would occur if:

- An activity would expose persons to or generate noise or vibration levels in excess of EPA-recommended levels
- An activity would result in a substantial permanent increase in ambient noise or vibration levels in the vicinity above levels existing without the Proposed Project. A 3 dB increase in noise is considered barely noticeable to humans, a 5 dB increase would typically result in a noticeable community response, and a 10 dB increase is considered a doubling of the sound and is generally considered to be substantial

4.9.3 IMPACT ASSESSMENT

The following considerations for construction and operation apply to both alternatives. Site specific analysis is provided in the following sections.

Construction

Construction equipment would generally not operate at the same time and would be spread throughout the construction area depending on the activity. Construction would occur intermittently at each of the wind turbine locations, typically during normal daytime working hours. Nighttime construction may be necessary to meet the overall Proposed Project schedule, and in such cases, residents would be notified of this temporary, short-term activity. Construction would generally occur for one week or less in any given area. As identified in **Table 4.9-1**, between 250 feet and 500 feet from the construction location, the anticipated noise levels would drop below the EPA-recommended noise guideline (70 dBA) to prevent hearing loss. Between 1,000 feet and 2,500 feet from the construction location, the construction noise levels are anticipated to drop below the EPA-recommended noise guideline (55 dBA) for residential areas.

Operation

During dry weather conditions, noise from transmission lines (operational “hum”) is generally lost in the background noise at locations beyond the edge of the transmission line right-of-way (DOE 2005). In wet conditions, however, water drops collecting on the lines provide favorable conditions for corona discharges, which can result in a humming noise. During rainfall events, the noise level at the edge of the right-of-way of a 230-kV transmission line would be less than 39 dBA (BPA 1996), which is typical of the noise level at a library or rural residential area. Operation of the transmission line would result in no impact to noise.

4.9.3.1 Crow Lake Alternative

Construction

The nearest residence to a proposed turbine location would be located approximately 1,270 feet away. On the basis of the noise levels presented in **Table 4.9-1**, it is estimated that noise levels would be 57 to 59 dBA. The minimum distance to a residence from the centerline of the alternative transmission line corridors would be approximately 1,900 feet. On the basis of the noise levels presented in **Table 4.9-1**, it is estimated that noise levels during construction of the transmission line would be 52 to 54 dBA or less at the nearest residence. The nearest residence to the proposed collector substation would be located approximately 6,700 feet away. On the basis of the noise levels presented in **Table 4.9-1**, it is estimated that noise levels would be 41 to 43 dBA. Construction of the turbines, transmission line, and proposed collector substation would result in a temporary increase in background noise to levels near the 55 dBA level, identified as desirable to protect against activity interference. This would be a noticeable, temporary increase over background noise levels. Thus, with the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), construction-related noise impacts would be less than significant.

The nearest residence to Western's existing Wessington Springs Substation is 1,500 feet away. On the basis of the noise levels presented in **Table 4.9-1**, it is estimated that construction noise levels would be approximately 56-58 dBA. If the Proposed Project is approved, Western system modifications at the existing Wessington Springs Substation, would include BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), and would result in short-term, temporary construction impacts. Therefore, impacts would be less than significant.

Operation

Based on noise modeling results of a similar wind project (Western 2007), anticipated noise levels would be between 50 dBA and 45 dBA at a distance between 660 feet and 1,320 feet from the wind turbine; therefore, noise levels associated with the wind turbines at the nearest residence would be near or below 45 dBA. As identified in **Section 3.9.3**, the average outdoor noise levels for rural residential and agricultural areas typically range from 39 dBA to 44 dBA. At the nearest residence, operational noise associated with the Proposed Project would likely be between 3 dB and 5 dB greater than existing ambient noise levels. With the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), impacts from operational noise would be less than significant, and operation of the transmission line would result in no impact to noise.

If the Proposed Project is approved, development of the Western system modifications at the existing Wessington Springs Substation, would include BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), and would similarly be expected to result in less than significant noise impacts.

Decommissioning

The decommissioning phase of the Proposed Project would be anticipated to result in similar noise effects as described for construction.

4.9.3.2 Winner Alternative

Construction

The nearest residence to a proposed turbine location would be located approximately 800 feet away. It is anticipated that this turbine location would be eliminated from further consideration, because it doesn't meet the Applicants' siting criteria.

The next nearest residence to a proposed turbine location would be 1,050 feet away from a proposed turbine location, and meets the Applicants' siting criteria. On the basis of the noise levels presented in **Table 4.9-1**, it is estimated that noise levels would be 57 to 59 dBA. Construction of the turbines would result in a temporary increase in background noise to levels above 55 dBA, but below the 70 dBA average level to prevent hearing loss over the course of a lifetime. This would be a noticeable, but temporary increase over background noise levels; with the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), construction-related noise impacts would be less than significant.

The nearest residence to the proposed collector substation would be located approximately 1,400 feet away. On the basis of the noise levels presented in **Table 4.9-1**, it is estimated that noise levels would be 56 to 58 dBA. Construction of the proposed collector substation would result in a temporary increase in background noise to levels above 55 dBA, but below the 70 dBA average level to prevent hearing loss over the course of a lifetime. This would be a noticeable, but temporary increase over background noise levels. With the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), construction-related noise impacts would be less than significant.

The closest residence to the centerline of the alternative 1 transmission line corridor is approximately 100 feet away, and due to this proximity, does not meet the Applicants' line siting criteria. It is anticipated that the alternative 1 transmission line corridor would be eliminated from further consideration.

The closest residence to centerline of the alternative 2 transmission line corridor is at least 900 feet away, and meets the Applicants' siting criteria. On the basis of the noise levels presented in **Table 4.9-1**, it is estimated that construction noise levels would be approximately 59 to 61 dBA. Construction of the alternative 2 transmission would result in a temporary increase above background noise, but would be within the level identified as desirable to protect against activity interference. With the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), construction-related noise impacts would be less than significant.

The nearest residence to Western's existing Winner Substation is 300 feet away. On the basis of the noise levels presented in **Table 4.9-1**, it is estimated that noise levels would be 69 to 71 dBA; therefore construction noise at the closest point would be near the EPA-recommended level of 70 dBA. However, the EPA-recommended level of 70 dBA applies to an estimated 40-year average exposure. Therefore the short-term, temporary construction impacts would likely be perceived at the nearest residence. With the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), impacts would be less than significant.

Operation

Anticipated noise levels would be between 50 dBA and 45 dBA at a distance between 660 feet and 1,320 feet from the wind turbine. The two nearest residences to a proposed turbine location would be located approximately 800 feet away and 1,050 feet away from a proposed turbine location. Noise levels associated with the wind turbines at the two nearest residences would be between 50 dBA and 45 dBA. As identified in **Section 3.9.3**, the average outdoor noise levels for rural residential and agricultural areas typically range from 39 dBA to 44 dBA.

At the nearest residence, operational noise associated with the Proposed Project would be closer to 50 dBA and well below the EPA guideline for outdoor noise levels; however, the increase would likely be between 5 dBA and 10 dBA greater than existing ambient noise levels. With the turbine locations currently indicated, the increased noise would likely be noticeable at the nearest residence. However, it is anticipated that the nearest turbine location would be eliminated from further consideration, because it doesn't meet the Applicants' siting criteria. With this consideration, impacts from operational noise would be less than significant. Operational noise at the second nearest residence, which meets the Applicants' siting criteria, would be closer to 45 dBA and would likely be between 3 dB and 5 dB greater than existing ambient noise levels. With the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), impacts from operational noise would be less than significant.

During dry weather conditions, noise from transmission lines (operational "hum") is generally lost in the background noise at locations beyond the edge of the transmission line right-of-way (DOE 2005). In wet conditions, however, water drops collecting on the lines provide favorable conditions for corona discharges, which can result in a humming noise. During rainfall events, the noise level at the edge of the right-of-way of a 230-kV transmission line would be less than 39 dBA (BPA 1996), which is typical of the noise level at a library or rural residential area. With the included BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), operation of the transmission line would result in no impact to noise.

The nearest residence to Western's existing Winner Substation is 300 feet away. If the Proposed Project is approved and employing the BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), Western system modifications at its Winner Substation would be expected to result in less than significant noise impacts.

Decommissioning

The decommissioning phase of the Proposed Project would be anticipated to result in similar noise impacts as described for construction.

4.9.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. There would be no noise impacts associated with the No Action Alternative.

4.10 SOCIOECONOMICS

4.10.1 METHODS

The socioeconomic analysis evaluates only the counties in which the Proposed Project alternatives are located. While economic effects could occur to additional counties and regions of the U.S., depending on where the specific Proposed Project Components are manufactured, these effects are impossible to determine at this time. For this reason, the ROI for the Crow Lake Alternative is limited to Aurora, Brule and Jerauld counties. The ROI for the Winner Alternative is limited to Tripp County. Potential impacts have been identified for each alternative based on the available resource information for the ROI with consideration to the significance criteria.

4.10.2 SIGNIFICANCE CRITERIA

A significant impact to socioeconomics would occur if:

- An activity would induce population growth that would impact government and community facilities and services from the in-migration of the Proposed Project workforce
- An activity would result in insufficient existing housing in the ROI within commuting distance sufficient to meet the influx of workers and their families
- An activity would result in a need for new or altered governmental services such as fire protection, police protection, schools, or other governmental services
- An activity would result in a need for new systems, or substantial alterations to utilities including power or natural gas, communications systems, water, sewer or septic tanks, solid waste and disposal

4.10.3 IMPACT ASSESSMENT

The below pertinent socioeconomic considerations have been included in the DEIS analysis, although they are not tied to a specific significance criteria.

<u>Lease and Easement Arrangements</u>

The Applicants' right-of-way agents have contacted landowners in the Proposed Project and the proposed Federal actions areas and have negotiated with landowners to acquire leasing rights for specific parcels of land. In general, a landowner who provides leasing rights would receive annual rental payments resulting in supplemental income. Potential lease payments would provide a long term supplement to farm and ranch incomes in these rural areas.

Employment and Secondary Economic Effects

According to the American Wind Energy Association (AWEA) *Wind Energy and Economic Development: Building Sustainable Jobs and Communities* (AWEA 2009a), the European Wind Energy Association has estimated that in total, every MW of installed wind capacity directly and indirectly creates about 60 person-years of employment and 15 to 19 jobs.

At the local level, new jobs are likely to be created that may involve site preparation and facility construction, maintenance during facility operation (which is typically about 20 years), and crews to perform decommissioning and site restoration work when the facility is closed. Secondary effects of the Proposed Project and the proposed Federal actions on the local economy may also exist through the need for service-sector businesses and jobs (gas stations, motels, restaurants, *etc.*).

Surveying 13 studies of economic impacts (actual and forecast) of wind facilities on rural economies, one NREL report concluded that these facilities have a large direct impact on the economies of rural communities, especially those with few other supporting industries; however, such communities also see greater “leakage” of secondary economic effects to outside areas. In addition, the report concluded that the number of local construction and operations jobs created by the facility depends on the skills locally available (NRC 2007).

Public Revenues and Costs

Typically, a wind-energy project generates tax dollars for both the local and State governments. Direct monies are collected through income, excise and property taxes, and indirect monies are generated from sales, use, and income taxes on project created employment. The State of South Dakota does not impose corporate or personal income taxes. However, South Dakota does generate revenue from sales, use, property and contractor excise taxes.

Sales/use tax in South Dakota is a combination of a four percent State tax and a general, municipal tax, which varies from zero to two percent (municipal taxes only apply if sale/use is within city limits). Property taxes in South Dakota are levied by local government (*e.g.* counties and municipalities). Real property taxes are determined by taking the local mill levy and applying it to 85 percent of the market value of a property. The contractors' excise tax (tax imposed upon the gross receipts of contractors who are engaged in construction services or realty improvements in South Dakota collectible from both public and private entities) is two percent.

The South Dakota State Legislature has been active in passing laws that affect the development, taxation and operation of wind-energy facilities in the State.

A number of recent laws have been passed by the State to provide construction rebates and an alternate taxation method on wind-energy facilities exceeding five MW.

4.10.3.1 Crow Lake Alternative

Given the short-term duration of construction activities, no significant increase in permanent population to local communities would be expected as a result of construction and operation of the Proposed Project. It would not result in significant increased needs for public services, including fire protection. In addition, there would be no discernible impact on local utilities, government, or community services from the construction workforce under the Proposed Project. Any impacts to social and economic resources would be primarily short-term effects to the local economy. Revenue would likely increase for some local businesses such as hotels, restaurants, gas stations and grocery stores, due to workers associated with construction. Other impacts to community services would be unlikely because of the short-term nature of construction.

The relatively short-term nature of construction and the limited number of workers who would be hired from outside of the local counties would result in limited positive economic impacts to the area in the form of increased spending on lodging, meals and other consumer goods and services. As described in **Chapter 2**, the Applicants would begin construction in mid-2010 and complete construction by the end of 2010. It is anticipated that local workers from the counties would fill the majority of the open construction jobs. The Applicants have estimated the Proposed Project would create an average of 225 to 250 temporary jobs and 10 to 12 permanent jobs.

Anticipated labor trades required during construction include electricians, crane operators, heavy equipment operators and other skilled construction laborers. Local businesses such as ready-mix concrete, hardware stores, welding and machine shops, packaging and postal services, and heavy equipment repair and maintenance service providers would also likely benefit from construction of the Proposed Project.

Minor employment or population changes are anticipated as a direct result of development of the Proposed Project. Any increase in population would be for the duration of the construction period, and would be small relative to the total population. Most of the non-local construction workforce would likely reside within a 60-mile commuting distance of the area, so there would be very little demand for additional temporary or permanent housing near the site. There would be no impact to the available supply of housing in Aurora, Brule or Jerauld counties. In the event that construction workers hired from outside the 60-mile radius of the standard commuting distance from the Proposed Project area, there would likely be sufficient capacity in the existing motel rooms in the local counties. Therefore, less than significant impacts are likely to occur from the influx of the construction workforce.

Benefits would also result from wages paid to the construction workforce. There would be beneficial long-term impacts to the counties' tax base for the life of the Proposed Project as a result of the construction and operation of the facilities. Aurora, Brule and Jerauld counties would receive revenues from property taxes, fees and permits. Additional personal income would be generated for residents in the counties and the State of South Dakota by circulation and recirculation of dollars paid out as business expenditures, and as State and local taxes. The most direct beneficial impact would be the net economic benefit to participating landowners from lease payments, which would provide a supplementary source of income. An increase in Aurora, Brule and Jerauld's county tax base would also provide benefits to all county residents. Indirect economic benefits would accrue to businesses in the area from construction workers purchasing goods and services. There would also be economic benefits for the counties from added taxes paid on real property. Increased tax revenues collected as a result of the Proposed Project operation could be utilized to benefit or improve local government or community services.

If the Proposed Project is approved, Western's system modifications at Wessington Springs Substation would similarly be expected to result in beneficial economic impacts. The influx of construction workers to install new electrical equipment would similarly be expected to result in less than significant impacts to housing availability or local services.

4.10.3.2 Winner Alternative

The positive local economic benefits to the Winner Alternative would be similar to those identified for the Crow Lake Alternative. The influx of construction workers for the Proposed Project would similarly be expected to result in less than significant impacts to housing availability or local services.

4.10.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. Local landowners would not receive lease payments from the Applicants and could sign leases with another wind power developer. There would be no socioeconomic impacts associated with the No Action Alternative.

4.11 ENVIRONMENTAL JUSTICE

4.11.1 METHODS

The ROI for the Crow Lake Alternative includes the following census tracts: 9731, 9736 and 9746. The ROI for the Winner Alternative includes the following census tracts: 9716 and 9717. **Section 3.11** identifies minority and low-income populations in the Proposed Project area pursuant to Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 FR 7629). This section discusses the potential for impacts to those populations (**Section 3.11**). The environmental justice analysis has been performed in three steps:

- Identify minority and/or low income populations in the ROI (see **Section 3.11**)

- Identify the anticipated impacts from development of the Proposed Project and/or the proposed Federal actions
- Determine if the anticipated activity impacts would disproportionately impact the minority and/or low-income populations

The analysis protocol for identifying minority or low-income populations follows the guidelines described in the *Environmental Justice Guidance under the National Environmental Policy Act* (CEQ 1997). Information on locations and numbers of minority and low-income populations for each census tract within the Proposed Project and the areas of the proposed Federal actions was obtained and derived from 2000 Census data. “Minority” refers to people who classified themselves in the 2000 Census as Black or African American, Asian or Pacific Islander, American Indian or Alaskan Native, Hispanic of any race or origin, or other non-White races (CEQ 1997). Environmental justice guidance defines low-income populations using U.S. Census Bureau statistical poverty thresholds. Information on low-income populations was developed from 1999 incomes reported in the 2000 Census. In 1999, the poverty-weighted average threshold for an individual was $8,501 (U.S. Census 2001).

Analyses of potential impacts from the Proposed Project and the proposed Federal actions are provided in **Chapter 4** for each resource including: geology and soils, water resources, air resources, biological resources, cultural resources, land use and recreation, transportation, visual resources, noise, socioeconomics, and health and safety, during the construction, operation and decommissioning phases.

An analysis was performed to determine if the anticipated impacts of the Proposed Project and the proposed Federal actions would disproportionately affect minority and low-income populations. The basis for making this determination was a comparison of locations predicted to experience human health or environmental impacts with any areas in the ROI known to contain high percentages of minority or low-income populations, as reported by the U.S. Census Bureau and defined by the CEQ. Impacts on minority or low-income populations that could result from the proposed activities were analyzed for the geographic areas in which the Proposed Project would be located. Impacts were analyzed within the census tracts containing the alternative sites to determine if minority or low-income populations would have disproportionately high and adverse impacts.

Environmental justice impacts are also analyzed for issues that are unique to and involve Native Americans, in particular, to cultural resource issues. Input from tribal representatives would determine if adverse impacts are likely to occur to cultural resources of importance to the tribes. Potential impacts of the proposed activities related to Native American cultural resources could occur not only to individual resources, but also to the traditional, sacred and historic landscape of the area within which the Proposed Project and the areas of the proposed Federal actions are located. Impacts to the cultural landscape and individual resources could have an adverse impact on the role of the landscape in tribal traditions and the use of the landscape by tribal members.

The following definitions are excerpted from Executive Order 12898:

Disproportionately high and adverse human health effects: When determining whether human health effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

(a) Whether the health effects, which may be measured in risks and rates, are significant (as employed by NEPA), or above generally accepted norms. Adverse health effects may include bodily impairment, infirmity, illness, or death

(b) Whether the risk or rate of hazard exposure by a minority population, low-income population, or Indian tribe to an environmental hazard is significant (as employed by NEPA) and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group

(c) Whether health effects occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards

Disproportionately high and adverse environmental effects: When determining whether environmental effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

(a) Whether there is or would be an impact on the natural or physical environment that significantly (as employed by NEPA) and adversely affects a minority population, low-income population, or Indian tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelated to impacts on the natural or physical environment

(b) Whether environmental effects are significant (as employed by NEPA) and are or may be having an adverse impact on minority populations, low income populations, or Indian tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group

(c) Whether the environmental effects occur or would occur in a minority population, low income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards

4.11.2 SIGNIFICANCE CRITERIA

Significance criteria were developed based on Executive Order 12898. A significant impact to environmental justice would occur if:

- An activity would disproportionately affect a minority, Native American, or low income subsistence population
- An activity would result in high and adverse health or environmental impacts, such as impacts from noise, dust or air emissions, displacement of residences, visual effects, traffic increases or delays, EMF effects, or other effects to a minority, Native American, or low income population

4.11.3 IMPACT ASSESSMENT

4.11.3.1 Crow Lake Alternative

Disproportionately high and significant effects to minority populations are unlikely based on three factors: a lower percentage of minority populations in the Crow Lake Alternative area (approximately one to five percent) compared with South Dakota as a whole (approximately 11 percent), a low population density within the Proposed Project area, and overall low expected impacts from the construction, operation and decommissioning of the Proposed Project. Potential impacts to minority residents, like any other resident, are expected to be less than significant.

As identified in **Table 3.11-1**, income for 13.2 percent of the population of South Dakota is considered below the poverty level, whereas the percentage of the population below the poverty level ranges between approximately 11 to 21 percent in the vicinity of the Crow Lake Alternative. The Proposed Project may generate positive economic benefits to the local economy, including opportunities for lease agreements, employment and earning potential for local individuals. Overall the Proposed Project is expected to result in low environmental impacts; therefore, the impacts to low-income populations would be less than significant.

If the Proposed Project is approved, development of the Western system modifications at Wessington Spring Substation would similarly not be expected to disproportionately affect a minority, Native American, or low income subsistence population.

4.11.3.2 Winner Alternative

Year 2000 demographic information from the U.S. Census Bureau characterizes the population in the vicinity of the Winner Alternative as approximately 84 percent White and 15 percent American Indian and Alaskan Natives. The Winner Alternative would be located in an area with a higher percentage of minority population compared to the Crow Lake Alternative; however, disproportionately high and significant effects to minority populations are unlikely given the low population density within the Proposed Project area, and overall low expected impacts from constructing, operating and decommissioning the Proposed Project. Potential impacts to minority residents, like any other resident, are expected to be less than significant.

Income for 13.2 percent of the population of South Dakota is considered below the poverty level, whereas the percentage of the population below the poverty level ranges between approximately 19 to 21 percent in the vicinity of the Winner Alternative. The Proposed Project may generate positive economic benefits to the local economy, including opportunities for lease agreements, employment, and earning potential for local individuals; therefore, the impacts to low-income populations would be less than significant.

Developing Western’s system modifications at Winner Substation would not be expected to disproportionately affect a minority, Native American, or low income subsistence population.

4.11.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. There would be no environmental justice impacts associated with the No Action Alternative.

4.12 HUMAN HEALTH AND SAFETY

4.12.1 METHODS

The ROI for health and safety includes areas of immediate disturbance associated with the Proposed Project Components and proposed Federal actions. The ROI associated with the proposed transmission line includes the area within the right-of-way. The assessment to human health and safety has been undertaken with the assistance of the previous compilations of technical memoranda (Terracon 2009a and 2009b) and the *Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM Administered Lands in the Western United States* (BLM 2005).

4.12.2 SIGNIFICANCE CRITERIA

A significant impact to human health and safety would occur if:

- An activity would result in a substantial increase in health and safety risks to area residents and the general public
- An activity would create potential impacts to public health as a result of increased electric and magnetic fields and electrocution hazards
- An activity would violate any local, State, or Federal regulations regarding handling, transport, or containment of hazardous materials

4.12.3 IMPACT ASSESSMENT

The *Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM Administered Lands in the Western United States* (BLM 2005) evaluates the potential health and safety impacts for a typical wind generation project. A summary of the Programmatic EIS is provided herein.

<u>Solid Waste and Hazardous Materials</u>

Types of hazardous materials that may be used in the construction, operation and decommissioning phases of the proposed activities may include: fuels (*e.g.*, gasoline, diesel), lubricants, cleaning solvents, paints, pesticides and explosives. **Table 4.12-1** lists these hazardous materials associated with a typical wind energy project, their use and typical quantities

Table 4.12-1 Hazardous and Regulated Materials Associated with a Typical Wind Energy Project

Hazardous and Regulated Material	Uses	Typical Quantities Present
Fuel: diesel fuel[a]	Powers most construction and transportation equipment during construction and decommissioning phases.	Less than 1,000 gallons (gal); stored in aboveground tanks during construction and decommissioning phases.[b]
	Powers emergency generator during operational phase.	Less than 100 gal; stored in aboveground tank to support emergency power generator throughout the operation phase.
Fuel: gasoline[c]	May be used to power some construction or transportation equipment.	Because of the expected limited number of construction and transportation vehicles utilizing gasoline, no on-site storage is likely to occur throughout any phase of the life cycle of the wind energy.
Fuel: propane[d]	Most probable fuel for ambient heating of control building.	Typically 500 to 1,000 gal; stored in aboveground propane storage vessel.
Lubricating oils/ grease/ hydraulic fluids/ gear oils	Lubricating oil is present in some wind turbine components and in the diesel engine of the emergency power generator.	Limited quantities stored in portable containers (capacity of 55 gal or less); maintained on-site during construction and decommissioning phases.
	Maintenance of fluid levels in construction and transportation equipment is needed.	Limited quantities stored in portable containers (capacity of 55 gal or less); stored on-site during operational phase.
	Hydraulic fluid is used in the rotor driveshaft braking system and other controls. Gear oil and/or grease are used in the drive train transmission and motor gears.	Limited quantities stored in portable containers (capacity of 55 gal or less); stored on-site during operational phase.
Glycol-based antifreeze	Present in some wind turbine components for cooling (*e.g.*, 5 to 10 gal [19 to 38 L] present in re-circulating cooling system for the transmission). Present in the cooling system of the diesel engine for the emergency power generator.	Limited quantities (10 to 20 gal of concentrate) stored on-site during construction and decommissioning phases. Limited quantities (1 to 10 gal of concentrate) stored on-site during operational phase.
Lead-acid storage batteries and electrolyte solution	Present in construction and transportation equipment. Backup power source for control equipment, tower lighting and signal transmitters.	Limited quantities of electrolyte solution (< 20 gal) for maintenance of construction and transportation equipment during construction and decommissioning phases. Limited quantities of electrolyte solution (< 10 gal) for maintenance of control equipment during operational phase.
Other batteries (*e.g.*, nickel-cadmium [NI-CAD] batteries)	Present in some control equipment and signal transmitting equipment. No maintenance of such batteries is expected to take place on-site.	
Cleaning solvents	Organic solvents (most probably petroleum-based but not Resource Conservation and Recovery Act listed) used for equipment cleaning and maintenance. Where feasible, water-based cleaning and degreasing solvents may be used.	Limited quantities (< 55 gal) on-site during construction and decommissioning to maintain construction and transportation equipment. Limited quantities (< 10 gal) on-site during operational phase to maintain equipment.

Hazardous and Regulated Material	Uses	Typical Quantities Present
Paints and coatings[e]	Used for corrosion control on all exterior surfaces of turbines and towers. Limited quantities (< 50 gal [189 L]) for touch-up painting during construction phase.	Limited quantities (< 20 gal) for maintenance during operational phase.
Dielectric fluids[f]	Present in electrical transformers, bushings and other electric power management devices as an electrical insulator.	Some transformers may contain more than 500 gal of dielectric solutions.
Explosives	May be necessary for excavation of tower foundations in bedrock. May be necessary for construction of access and/or on-site roads or for grade alterations on-site.	Limited quantities equal only the amount necessary to complete the task. On-site storage expected to occur only for limited periods of time as needed by specific excavation and construction activities.
Pesticides	May be used to control vegetation around facilities for fire safety.	Pesticides would likely be brought to the site and applied by a licensed applicator as necessary.

Source: BLM 2005

[a] It is assumed that commercial vendors would replenish diesel fuel stored on-site as necessary.

[b] This value represents the total on-site storage capacity, not the total amounts of fuel consumed. See footnote a. On-site fuel storage during construction and decommissioning phases would likely be in aboveground storage tanks with a capacity of 500 to 1,000 gal. Tanks may be of double-wall construction or may be placed within temporary, lined earthen berms for spill containment and control. At the end of construction and decommissioning phases, any excess fuel as well as the storage tanks would be removed from the site, and any surface contamination resulting from fuel handling operations would be remediated. Alternatively, rather than store diesel fuel on-site, the off-road diesel-powered construction equipment could be fueled directly from a fuel transport truck.

[c] Gasoline fuel is expected to be used exclusively by on-road vehicles (primarily automobiles and pickup trucks). These vehicles are expected to be refueled at existing off-site refueling facilities.

[d] Delivered and replenished as necessary by a commercial vendor.

[e] It is presumed that all wind turbine components, nacelles, and support towers would be painted at their respective points of manufacture. Consequently, no wholesale painting would occur on-site. Only limited amounts would be used for touch-up purposes during construction and maintenance phases. It is further assumed that the coatings applied by the manufacturers during fabrication would be sufficiently durable to last throughout the operational period of the equipment and that no wholesale repainting would occur.

[f] It is assumed that transformers, bushings and other electrical devices that rely on dielectric fluids would have those fluids added during fabrication. However, very large transformers may be shipped empty and have their dielectric fluids added (by the manufacturer's representative) after installation. It is further assumed that servicing of electrical devices that involves wholesale removal and replacement of dielectric fluids would not likely occur on-site and that equipment requiring such servicing would be removed from the site and replaced. New transformers, bushings or electrical devices are expected to contain mineral-oil-based or synthetic dielectric fluids that are free of polychlorinated biphenyls; some equipment may instead contain gaseous dielectric agents (*e.g.*, sulfur hexafluoride) rather than liquid dielectric fluids.

that may be anticipated in each phase. Handling and disposal of these items fall under Federal, State, and local laws and regulations.

<u>Construction Activities</u>

Minimal solid waste is expected to be generated during construction of the Proposed Project Components. Shipping and packing materials and ground clearing are expected to be the most likely activities generating solid wastes. Solid wastes generated from construction activities would be stored in closed containers in accordance with regulatory requirements. The Applicants and Western would adhere to their BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**), and all construction waste including trash and litter, garbage, other solid waste, petroleum products and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials.

To minimize impacts from potential leaks of hazardous materials or industrial wastes during on-site storage, materials storage and dispensing areas (*e.g.*, fueling stations for off-road construction equipment), as well as waste storage areas, would be equipped with secondary containment features.

Small amounts of hazardous waste may be generated during construction of the Proposed Project (**Table 4.12-1**). All petroleum fluids would be contained within the wind turbines and electrical equipment. The Applicants and Western would adhere to their BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**) regarding petroleum hazardous waste and material would be handled and disposed of in accordance with all applicable Federal, State and local laws and regulations. To further minimize risks and ensure timely response to accidental leaks or spills, spills would be immediately reported to construction inspectors so that cleanup activities could be implemented.

Operation

There would be only small volumes of solid waste produced during operation of the Proposed Project. Unlike traditional power generation facilities, wind farms do not produce solid waste products as a direct result of energy conversion. Typically, the facility would be maintained by personnel who would generate approximately 0.5 to 1.0 cubic yards/month/personnel of recyclable waste and 1.0 to 2.0 cubic yards/month/personnel of non-recyclable waste.

Small amounts of hazardous waste may be generated due to typical maintenance activities during operation of the Proposed Project Components (**Table 4.12-1**). Hazardous wastes would be handled and disposed in accordance with all applicable Federal, State and local laws and regulations, and the BMPs and APMs (**Chapter 2, Tables 2.2** and **2.3**).

Decommissioning

At the end of the wind farm life cycle, large amounts of solid wastes would result from dismantling the Proposed Project Components. Recycling Proposed Project Components, where feasible, would be a priority, and the remaining materials would be placed in an appropriate waste disposal facility. Possible components that may be recycled include tower segments, electrical transformers and concrete foundations.

Waste Collection

Waste receptacle bins for both solid and hazardous waste would be provided during both construction, operation and decommissioning for the Proposed Project Components. The amount of waste generated should be minimal. Recycling of materials would occur when feasible.

The solid waste resulting from construction and decommissioning would be transported by a commercial trash company and disposed of in a designated landfill. “Roll-offs” may be available at multiple locations for disposal construction debris. Mixed-material waste would be transported to a transfer station, waste disposal facility, or commercial recycling facility.

Occupational Hazards

The types of activities that typically occur during construction, operation and decommissioning of a wind energy development project include a variety of major actions, such as establishing site access; excavating and installing tower foundations; tower assembly; constructing the central control building, electrical substation, meteorological towers and access roads; and routine maintenance of the turbines and ancillary facilities. Construction and operations workers at any facility are subject to risks of injuries and fatalities from physical hazards. While such occupational hazards can be minimized when workers adhere to safety standards and use appropriate protective equipment, fatalities and injuries from on-the-job accidents can still occur. Occupational health and safety are protected through the Federal Occupational Safety and Health Administration (OSHA) (29 U.S. Code 651, *et seq.*) and State laws.

An operator's instruction manual would be prepared in conformance with the International Electrotechnical Commission (IEC) minimum safety requirements for wind turbine generators (IEC 1999), with supplemental information on special local conditions. The manual would include system safe operating limits and descriptions, start-up and shutdown procedures, alarm response actions and an emergency procedures plan. The emergency procedures plan would identify probable emergency situations and the actions required of operating personnel. The emergency procedures plan may address over-speeding, icing conditions, lightning storms, earthquakes, broken or loose guy wires, brake failure, rotor imbalance, loose fasteners, lubrication defects, sandstorms, fires, floods and other component failures.

Chemical exposures during construction and operation of a typical wind energy project are expected to be routine and minimal, and reduced by using personal protective equipment and/or engineering controls to comply with OSHA permissible exposure limits applicable for construction activities.

Public Safety and Site Security

The Programmatic EIS (BLM 2005) identifies a rotor blade breaking and parts being thrown as one of the primary safety hazards of wind turbines. This type of occurrence is anticipated to be extremely rare, particularly with today's generation of turbines. The probability of a fragment hitting a person is even lower. The related issue of ice throw can occur if ice builds up on the turbine blades. As a design characteristic, wind turbines would be set back at least 1,000 feet from occupied residences.

Unauthorized or illegal access to site facilities and the potential for members of the public to attempt to climb towers, open electrical panels, or encounter other hazards is another concern. This section also evaluates the potential for sabotage and terrorism-related impacts (also referred to as Intentional Destructive Acts).

Security measures would be taken during construction and operation, including temporary and permanent (safety) fencing at the substation, warning signs and locks on equipment and wind power facilities. Also, turbines would sit on solid-steel-enclosed tubular towers in which all electrical equipment would be located, except for the pad-mounted transformer. Access to the turbines would only be through a solid steel door that would be locked when not in use. These measures would also act to reduce potential sabotage and terrorism-related impacts. Western and RUS believe that the Proposed Project presents an unlikely target for an act of terrorism, with an extremely low probability of attack. The potential for the Proposed Project to be targeted in terrorism-related activity would be negligible. All authorized personnel would be issued specific access entry codes/keys to regulate entry into the facilities, including substation and O&M building areas. These measures would limit access and deter intruders.

Electric and Magnetic Fields

EMF is composed of both electric and magnetic fields. Electric fields are produced by voltage (or electric charges). Electric fields increase in strength as the voltage increases and are measured in units of volts per meter (V/m). Magnetic fields result from the flow of load current in transmission line conductors or any electrical device. The magnetic field also increases in strength as the current increases and is measure in units of Gauss (G) or Tesla (T). The Gauss is the unit most commonly used in the United States and the Tesla is the internationally accepted scientific term; 1 T is equivalent to 10,000 G. Since a Gauss or Tesla are both very large fields and the majority of magnetic field exposure are substantially lower, values typically reported and measured are in milligauss (mG) (1/1,000 of a Gauss) and microtesla (µT) (1/1,000,000 of a Tesla, equivalent to 10 mG). Both the electric and magnetic field decrease rapidly, or attenuate, with distance from the source. Electric field induction effects are not generally associated with 230 kV transmission lines.

Exposures to extremely low-frequency EMF from natural and anthropogenic sources are ubiquitous. However, concerns about potential adverse health effects from residential and occupational exposures have been explored. Over the past 25 to 30 years, hundreds of studies have been performed to examine whether power-frequency (60-Hertz [Hz]) electric and magnetic fields pose a potential human health risk. The majority of the scientific studies have been conducted in the following research fields: epidemiology, laboratory cellular research and animal studies. In the U.S. and internationally, expert scientists from a variety of disciplines were assembled to review this very large body of research material and to assess the potential health risk. Major reviews of the existing research have concluded that the current body of scientific evidence does not show that exposure to power-frequency 60-Hz electric and magnetic fields represent a human health hazard.

EMF would be present in the vicinity of overhead power lines and the electric substation. While there is the potential for any generator to produce EMF, the 60-Hz frequencies are thought to be too low to damage human tissue, and EMF would diminish to background levels near the edge of the transmission line right-of-way.

Aviation Operations and Electromagnetic Interference

The Programmatic EIS (BLM 2005) considered two primary aviation safety considerations, including (1) the physical obstruction of the tower itself, and (2) the effects on communications, navigation, and surveillance systems, such as radar. The potential vertical obstruction of the wind turbine, like any tall structure, could pose a hazard to aircraft arriving or departing at a nearby airfield. See **Sections 3.7** and **4.7** for additional description of the proximities to local airports.

Moving wind turbine blades interfere with radar by essentially creating radar echoes, however radar installations can be modified to eliminate this potential problem. Interference with other electromagnetic transmissions can occur when a large wind turbine is placed between a radio, television, or microwave transmitter and receiver, including potential disruptions of public safety communication systems.

Low-Frequency Sound

In addition to more audible noise as discussed in **Section 4.9**, wind turbines are capable of generating low-frequency sound waves. Low-frequency sound may be perceived audibly as well as a vibration. Research suggests that low-frequency sound is disturbing, irritating and even tormenting to some people. Insomnia, headaches and heart palpitations have also been reported as secondary effects.

Infrasound and low-frequency noise are ubiquitous, since they are generated from natural sources (*e.g.*, earthquakes, wind) and anthropogenic sources (*e.g.*, automobiles, industrial machinery, household appliances) and are common in urban environments. The primary effect appears to be annoyance, and has not been proven to result in adverse health impacts.

Shadow Flicker

As discussed in the Programmatic EIS (BLM 2005), shadow flicker refers to the phenomenon that occurs when the moving blades of wind turbines cast moving shadows that cause a flickering effect. While the flickering effect may be considered an annoyance, there is also concern that the variations in light frequencies may trigger epileptic seizures in the susceptible population. However, the rate at which modern three-bladed wind turbines rotate generates blade-passing frequencies of less than 1.75-Hz, below the threshold frequency of 2.5-Hz, indicating that seizures should not be an issue.

Wastewater

Especially during the construction and decommissioning phases, and, to a lesser extent, during the operational phase, sanitary wastewater is generated by the work crews or maintenance personnel present on-site. During the construction and decommissioning phases, work crews of 50 to 300 individuals may be present. During the operational phase, a maintenance crew of 10 to 12 individuals is likely to be present on the site daily during business hours. Wastewater would be collected in portable facilities and periodically removed by a licensed hauler and introduced into existing municipal sewage treatment facilities. A septic tank and drainage field would likely be included at the O&M building.

Storm Water and Excavation Water

Except in those instances of spills or accidental releases, storm water runoff and excavation waters from the Proposed Project alternatives are not expected to have industrial contamination but may contain sediment from disturbed land surfaces.

4.12.3.1 Crow Lake Alternative

The health and safety risks to area residents and the general public for the Crow Lake Alternative would be restricted to short periods during construction, operation and decommissioning at small, individual sites. The included BMPs and APMs (as listed in **Chapter 2, Tables 2.2** and **2.3**) would be employed during all ground disturbing activities. Due to the low voltage at which turbines and overhead and underground collector lines operate, and the setback distances from roads and residences, the potential impacts associated with EMF would be minimal. Magnetic field exposure from the facilities would be minimal in close proximity, and both electric and magnetic fields would dissipate from the facility corridors. Further, the development of the Proposed Project Components would comply with applicable local, State and Federal regulations regarding handling, transport or containment of hazardous materials. For these reasons, impacts to human health and safety would be less than significant.

Western's Wessington Springs Substation is fenced and specific access is limited to authorized personnel. Western maintains a security plan for the facility and any intrusions would be addressed by Western's security personnel and/or law enforcement personnel. The Wessington Springs Substation would be operated in accordance with Western's safety requirements; wastewater would be collected in portable facilities. Stormwater from would be directed away from the site in accordance with the Proposed Project's SWPPP, and BMPs and APMs (as listed in **Chapter 2, Tables 2.2** and **2.3**) would be employed. Impacts to human health and safety would be less than significant.

4.12.3.2 Winner Alternative

Impacts of the Winner Alternative would be similar to those identified for the Crow Lake Alternative. With the included BMPs and APMs (as listed in **Chapter 2, Tables 2.2** and **2.3**), impacts to health and safety would be less than significant.

Western's system modifications proposed for the Winner Substation would result in less than significant impacts, similar to the Wessington Springs Substation proposed for the Crow Lake Alternative.

4.12.3.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection request with the Applicants and/or RUS would not approve financing. For the purpose of impact analysis and comparison in this EIS, it is assumed that the Proposed Project would not be built and that the environmental impacts associated with construction and operation of the Proposed Project would not occur. There would be no human health and safety impacts associated with the No Action Alternative.

5 Cumulative Impacts

The CEQ regulations for implementing NEPA define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7).

5.1 METHODS

Cumulative impacts were assessed by combining the effects of past activities, present ongoing activities, and reasonably foreseeable future actions with the potential effects of the Proposed Project. Each of the resource categories were analyzed, however, differences between the two alternative sites were considered marginal for this cumulative impacts analysis of past, present and reasonably foreseeable actions and therefore both sites were addressed simultaneously.

The CEQ regulations (40 CFR 1508.7) further explain, "cumulative effects can result from individually minor but collectively significant actions taking place over a period of time." Based on these regulations, if the project does not have direct or indirect effects there can be no cumulative effects resulting from the project because there would be no impacts added to past, present, or reasonably foreseeable actions. Because the No Action Alternative has no direct or indirect effects on any resources, it would have no cumulative impacts and is not further evaluated in this chapter. Anticipated Proposed Project activities and resultant effects were described in **Chapters 1** through **4** of this DEIS. The ROI varies by resource, as described in **Chapter 3**, Affected Environment.

5.2 PAST AND PRESENT ACTIONS

Wind and other renewable sources are expected to become a larger share of the total electric generation resource in the U.S. for several reasons, primarily a desire to reduce overall GHG emissions, help increase energy security, and aid in economic stimulus efforts. Local, State and national energy policies are increasingly incorporating renewable portfolio standards, with wind as a major component, and targeting implementation of such standards by 2020 or sooner. Consequently, installation of wind and other renewable generation has increased dramatically, especially in the last 8-10 years. Between 2002 and 2006, wind generation (in thousands of kilowatt hours [kWh]) rose from approximately 10,400,000 to 26,600,000 (EIA 2008). In 2008, approximately 8,500 MW of new wind energy were installed in the U.S., representing roughly 40% of new power producing capacity, and making wind the second largest new generation source (AWEA 2009). See **Figure 5.1** for a depiction of the Midwest Independent Transmission System Operator (MISO) projects with approved interconnection agreements (which also depicts migratory flyways referenced in **Section 5.4.1**).

The Federal Production Tax Credit, recently extended through the American Recovery and Reinvestment Act of 2009, has been a major incentive for wind energy development. With the recent economic downturn, difficulties in obtaining credit reportedly have hampered the addition of wind power capacity by some developers. Also in early 2009, the EPA declared that GHGs are a threat to human health, which may lead to additional regulatory or legislative action to reduce GHG emissions.

The Federal government has also recognized the need for improvement to the nation's transmission infrastructure and the alleviation of transmission constraints. The current administration has raised attention to this situation as it emphasizes renewable energy development. The American Reinvestment and Recovery Act granted Western $3.2 billion in budget authority "… to construct, finance, facilitate, own, plan, operate, maintain or study construction of new and/or upgraded electric power transmission lines and related facilities … for delivering or facilitating the delivery of power generated by renewable energy resources constructed or reasonably expected to be constructed" (Western 2009). The acting FERC chairman has highlighted transmission line infrastructure needs and planning, siting, and interconnection considerations for renewable energy, including development of a so-called 'smart grid' (FERC 2009).

Basin Electric alone has 214 MW generated from current renewable energy facilities, and additional total generation under construction of 630 MW, as well as a total committed in-construction and future wind projects in the Dakotas of 555 MW. These currently consume some of the transmission capacity identified as available.

Existing utility infrastructure within the Crow Lake Alternative area includes Western's existing transmission system including a 230-kV transmission line and the Wessington Springs Substation. In addition, the existing Wessington Springs Wind Project, a 51 MW wind energy generating facility (Western 2007), is located adjacent to the northeast edge of the Crow Lake Alternative. Existing utility infrastructure within the Winner Alternative area includes Western's existing transmission system, including a 115-kV transmission line and the Winner Substation.

5.3 REASONABLY FORESEEABLE FUTURE ACTIONS

Growth in wind generation is expected to slow appreciably through 2010, after having grown 50 percent in 2008 (EIA 2009). Nonetheless, the EIA forecast through 2030 indicates steady growth in wind capacity through 2012, after which capacity increases slightly, but essentially levels off, through 2030. In 2030, wind is forecast to be 2.5 percent of total generation. Also, an increase in the cost of carbon-based generation would make wind power more economical, which could drive wind development. If legislation allowed for the conversion of renewable energy credits to emissions offsets, wind development could be even more prolific (SDPUC 2009). See **Figure 5.1** for a depiction of the MISO approved interconnection projects.

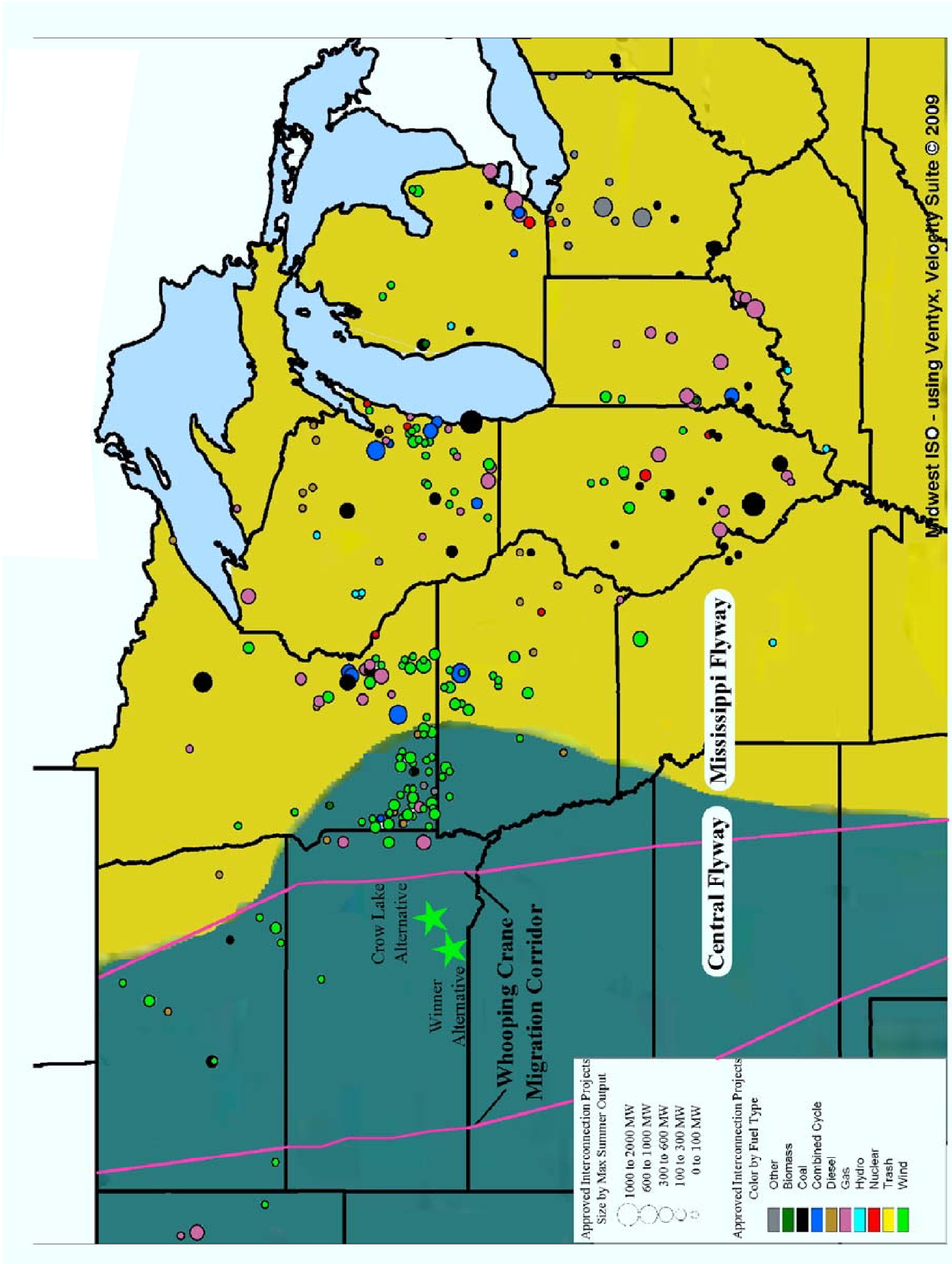


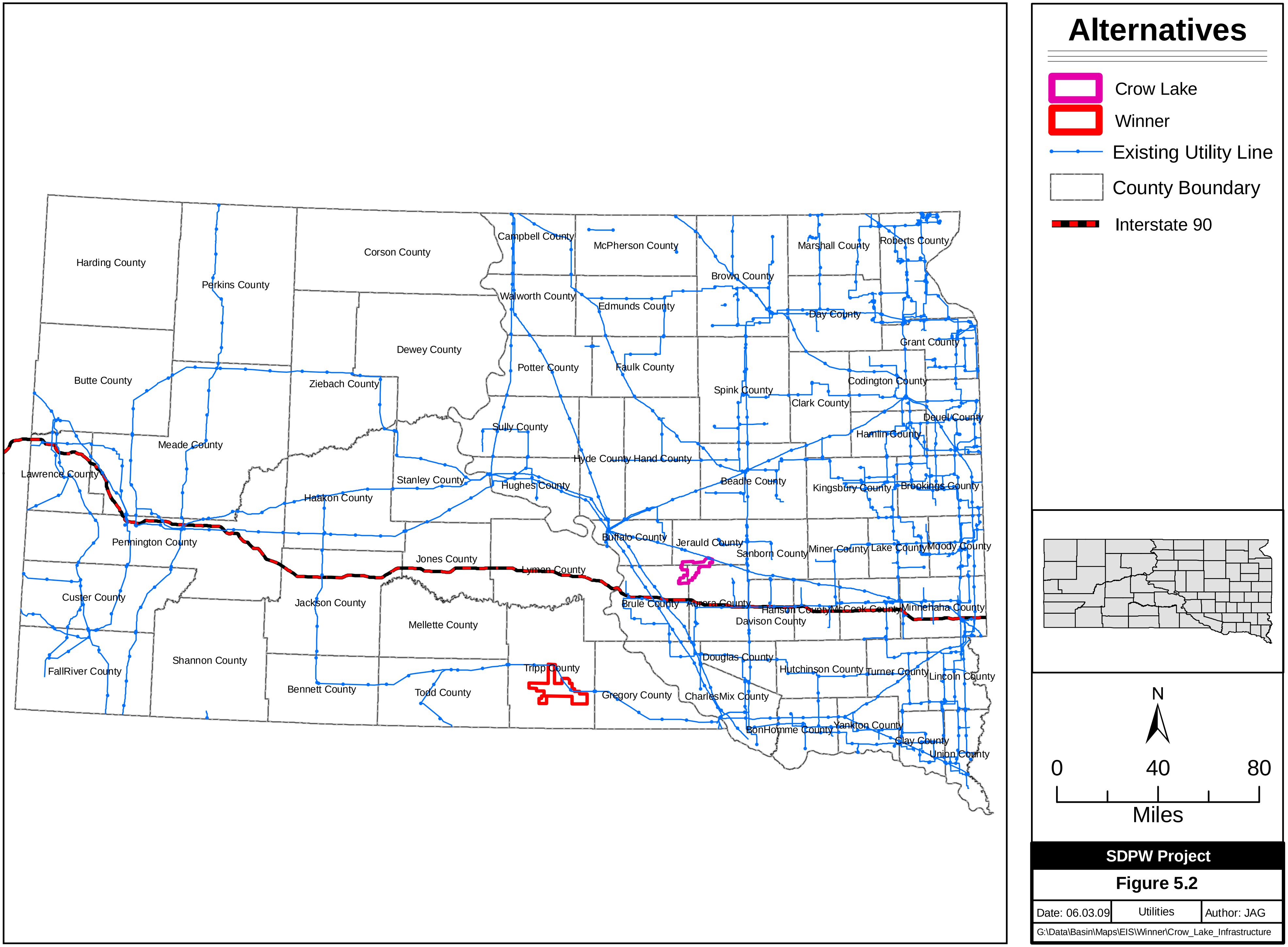
Figure 5.1 Midwest Independent System Operator Approved Interconnection Projects and Migratory Flyways

Table 5.1 Existing Wind Energy Projects in South Dakota

Name	Location	Power Capacity (MW)	Units	Turbine Mfr.	Developer	Owner	Power Purchaser	Year Online
Buffalo Ridge	Brookings County	50.4	24	Suzlon	Iberdrola Renewables	Iberdrola Renewables	NIPSCO	2009
Wessington Springs	Jerauld County	51	34	GE Energy	Babcock & Brown	Pattern Energy Group LP	Heartland Consumers Power District	2009
Tatanka Wind Project	McPherson County	88.5	59	Acciona	Acciona Energy	Acciona Energy		2008
Minn-Dakota Wind Farm	Brookings County	54	36	GE Energy	PPM Energy	PPM Energy	Xcel Energy	2007
Highmore Wind Energy Project	Highmore	40.5	27	GE Energy	FPL Energy	FPL Energy	Basin Electric	2003
Rosebud Sioux Wind Energy Project	Rosebud Sioux reservation	0.75	1	NEG Micon	Rosebud Sioux	Rosebud Sioux	Rosebud Sioux	2003
Canova	Near Carthage	0.11	1	Micon	City of Howard	City of Howard	City of Howard	2002
Gary Wind Energy Project	Gary	0.09	1	Vestas	Energy Maintenance Services-Distributed Energy Services	Energy Maintenance Services-Distributed Energy Services	Energy Maintenance Services-Distributed Energy Services	2002
Chamberlain Wind Project	Chamberlain	2.6	2	Nordex	Crown Butte Wind Power	Basin Electric	Basin Electric/East River Coop	2001
Howard Wind Energy Project	Howard	0.22	2	Micon	City of Howard	City of Howard	City of Howard	2001

South Dakota is one of the top ranked States for potential wind development in the U.S., and has actively promoted development of wind energy. The State offers a wind energy tax credit and a reduced property tax for wind facilities; the wind energy credit was extended in March 2009. Although South Dakota has high wind potential, like many other States, it has not been fully developed because of the limited amount of installed transmission. The distance of the markets from the wind regions of South Dakota further compounds this issue.

Recognizing this, South Dakota and 4 nearby States have discussed integrated transmission development in support of wind energy that will promote regional electric transmission investment and cost sharing. The States working together are contributing to the Upper Midwest Transmission Development Initiative to identify energy generation resources, transmission projects and infrastructure needed to support those resources in a cost-effective manner. Over the next 10 months, participants will determine a reasonable allocation of costs for necessary infrastructure ultimately leading to the development of a concrete plan or tariff proposal for


Alternatives
Crow Lake
Winner
Existing Utility Line
County Boundary
Interstate 90
N
0
40
80
Miles
SDPW Project
Figure 5.2
Date: 06.03.09
Utilities
Author: JAG
G:\Data\Basin\Maps\EIS\Winner\Crow_Lake_Infrastructure
Harding County
Perkins County
Corson County
Campbell County
McPherson County
Brown County
Marshall County
Roberts County
Walworth County
Edmunds County
Day County
Grant County
Butte County
Ziebach County
Dewey County
Potter County
Faulk County
Spink County
Codington County
Clark County
Deuel County
Hamlin County
Sully County
Hyde County
Hand County
Beadle County
Kingsbury County
Brookings County
Meade County
Lawrence County
Stanley County
Hughes County
Haakon County
Pennington County
Buffalo County
Jerauld County
Sanborn County
Miner County
Lake County
Moody County
Jones County
Lyman County
Custer County
Jackson County
Brule County
Aurora County
Hanson County
McCook County
Minnehaha County
Davison County
Mellette County
Shannon County
Douglas County
Hutchinson County
Turner County
Lincoln County
FallRiver County
Tripp County
Bennett County
Todd County
Gregory County
CharlesMix County
BonHomme County
Yankton County
Clay County
Union County

consideration by the MISO. See **Figure 5.2** for a depiction of existing utilities across South Dakota.

Communications with planning and zoning personnel from Aurora (Vissia 2009), Brule (Westendorf 2009), Jerauld (Reindle 2009), and Tripp (Hirsh 2009) did not identify any proposed projects within these counties. Based on the excellent wind resource in South Dakota, it is likely that more renewable energy and associated transmission projects will be proposed in the near future. However, the following actions were identified through the regional research conducted, but were excluded from the cumulative impacts analysis for the stated reasons.

South Dakota State Transportation Improvement Plan Transportation Project

The 2010 to 2014 South Dakota State Transportation Improvement Plan (SDDOT 2009) identified projects associated with SR45 in Brule County and US183 in Tripp County. Both of these projects are identified as resurfacing projects and would occur during the 2011 to 2012 timeframe. These resurfacing projects have not been included in the cumulative impacts analysis because both would result in temporary impacts associated only with duration of the resurfacing project and would occur after completion of construction of the Proposed Project and, therefore, would not result in a cumulative impact.

Rosebud Sioux Tribe Wind Project

The Rosebud Sioux Tribe proposes to construct a wind project in Todd County approximately 2.5 miles north of Mission, South Dakota. The tribe currently has interconnection requests within Western's queue for 90 MW and/or 100 MW; however, system impact studies relating to these interconnection requests have not yet begun. Depending on the outcome of system impact studies, the tribe may develop the project as a 90 MW, 100 MW or 190 MW wind farm (Haukaas 2009). At this time, the Rosebud Sioux Tribe project proponents are conducting preliminary environmental studies. Because this proposed wind project is in preliminary study stages and is not sufficiently advanced in project development, it has been excluded from the cumulative impact analysis.

5.4 CUMULATIVE IMPACT ANALYSIS

Cumulative effects were evaluated for both the construction (pending approvals, anticipated to begin mid-2010 and complete construction by the end of 2010) and post-construction (operation) periods of the Proposed Project. As identified in **Chapter 4**, the Proposed Project's impacts to the following resources are anticipated to be minimal and primarily occur during construction: geology and soils, water, land use, noise, socioeconomics, environmental justice, and health and safety. Additionally, there are no other proposed projects identified within the ROI for the aforementioned resources, therefore, these resources will not be further evaluated for cumulative impacts. Where applicable, the Applicants' and Agencies' standard BMPs (see **Table 2.2)**, and Applicants' APMs (see **Table 2.3**) have been included and would be used for the Proposed Project and proposed Federal actions as appropriate, thereby reducing or eliminating the potential for incremental effects resulting from the Proposed Project.

5.4.1 CLIMATE CHANGE AND AIR QUALITY

Cumulative impact analysis for climate change includes consideration of the ROI for the project, and State and national GHG emission reduction efforts. Current national and State practices include the inventory of GHG emissions to compare the relative contribution of different emission sources and GHG emissions to climate change. According to the EPA, "a GHG inventory is an accounting of the amount of GHGs emitted to or removed from the atmosphere over a specific period of time (e.g., one year). A GHG inventory also provides information on the activities that cause emissions and removals, as well as background on the methods used to make the calculations. Policy makers use GHG inventories to track emission trends, develop strategies and policies and assess progress. Scientists use GHG inventories as inputs to atmospheric and economic models. To track the national trend in emissions and removals since 1990, EPA develops the official U.S. GHG inventory each year. The national GHG inventory is submitted to the United Nations in accordance with the Framework Convention on Climate Change. In addition to the U.S. inventory, GHG emissions can be tracked at the global, State and local levels as well as by companies and individuals."

CO_2 is one of six GHGs that contribute to climate change. CO_2 emissions represent approximately 84 percent of all GHG emissions in the U.S. The greatest advantage of wind power is electricity generation without air emissions, including CO_2. Within South Dakota, CO_2 emissions resulting from fossil fuel combustion totaled 13.78 million tons in 2007 (EPA 2009a). Of these, activities related to the generation of electric power accounted for 2.96 million tons of CO_2 emitted in South Dakota (EPA 2009a). Further, operation of the Proposed Project would offset emission sources when compared to similarly-sized electric generating facilities using carbon-based fuel sources; thus, contribute to the national and State efforts to minimize GHG emissions.

5.4.2 BIOLOGICAL RESOURCES

There are three cumulative impact analysis areas for biological resources: 1) the ROI for vegetation, mammals (excluding bats), reptiles, amphibians; 2) the Aransas-Wood Buffalo National Park migration corridor (Whooping Crane); and 3) the State of South Dakota central flyway (bats and birds, excluding Whooping Crane).

Some biological resources would be lost due to the construction and operation of the Proposed Project. Construction of the Proposed Project Components would result in the permanent loss of a small amount of native vegetation and wildlife habitat, and could result in a minor number of mammal, reptile, and amphibian mortalities. Impacts to these biological resources resulting from the Proposed Project would be minimal within the ROI, and incremental impacts would not increase cumulative impacts.

A BA is being prepared under Section 7 of the ESA for Federally-listed species. Impacts, including cumulative impacts, will be determined in the BA and findings will be summarized in the FEIS. Western and RUS will follow USFWS recommendations provided during the Section 7 consultation process. While SDCL 34A-8 does not require agency consultation for State-listed threatened and endangered species, SDGFP has been active in the preparation of this DEIS.

Operation of the Proposed Project would likely result in avian and bat mortalities (see **Sections 4.4.3.1 and 4.4.3.2**), mainly as a result of habitat fragmentation, and potential collisions with new overhead transmission lines and wind turbines. FAA marker lights would be installed on turbines taller than 200 feet and may incrementally increase cumulative effects on avian species in areas where they are highly concentrated. As discussed in Sections **5.2 Past and Present Actions** and **5.3 Reasonably Foreseeable Future Actions**, there are numerous existing and proposed transmission and wind generation projects in South Dakota that have or may have similar impacts on birds and bats. However, most of these projects are located in eastern South Dakota and considerably distant from the Proposed Project areas. Existing transmission lines and wind generation projects have negatively affected birds and bats, and, as discussed in **Sections 5.2** and **Section 5.3**, the likely need for additional wind generation facilities and transmission capacity to meet increasing demand could increase cumulative effects in areas where these facilities are concentrated, such as eastern South Dakota. Incremental impacts associated with the Proposed Project may result in increased cumulative impacts when added to other wind and transmission projects near the Proposed Project. However, the Proposed Project is geographically isolated from the majority of existing and proposed wind generation facilities and transmission lines. Therefore, bird and bat species utilizing the habitats in eastern South Dakota would not likely be incrementally impacted by the Proposed Project.

Given the current economic climate and a host of other variables, it is difficult to accurately predict the actual growth of wind energy in South Dakota and other top wind states, many of which also lie within the central flyway. However, the number of turbines and associated infrastructure is growing, and will likely continue to grow into the near future. Research on how birds and bats respond to wind turbines remains nascent, so it is difficult to predict the cumulative impacts of wind energy project development and transmission line development and disturbance within the central flyway. It can be assumed that as development and disturbance within the central flyway continues to increase, this would continue to degrade migratory and resident bird and bat habitat quality and quantity. Past activities that have affected habitat in the project area include conversion of native vegetation and CRP lands for farming, and construction of roads, transmission lines, and residences. Development of electrical power generation and transmission within the central flyway has contributed to a baseline condition that presents some level of risk to a bird and bat populations. Continued development of power generation and transmission, whether from renewable or non-renewable sources, will increase the potential for habitat fragmentation and collisions with structures.

5.4.3 CULTURAL RESOURCES

Cumulative impacts to cultural resources, such as prehistoric properties, historic properties, and cultural landscapes, cannot be determined until the results of the Class III Survey and TCP Survey are completed. A MOA is being developed among Western, RUS, SHPO, affected Federal agencies, Applicants and interested Native American Tribes. The preferred minimization measure is to avoid identified sites; however, the MOA would provide an agreement among the parties for the treatment of the unavoidable adverse impacts. Compliance with the MOA provisions would ensure that Section 106 requirements are met, and incremental increases to cumulative cultural effects reduced.

5.4.4 TRANSPORTATION

FAA recently developed a new set of recommendations for lighting wind farms that would require fewer lights than needed under its current policy. The new recommendations suggest red or white synchronized flashing strobe lights, at most 0.5 mile apart around the perimeter of wind farms. Daytime lighting and dual lighting of the turbines were deemed unnecessary. However, the USFWS discourages the use of red flashing lights due to wildlife impacts (USFWS 2003). Prior to construction, the Applicants would consult with FAA to identify applicable lighting requirements. Based on this, the Proposed Project would not incrementally increase cumulative impacts to aviation.

5.4.5 VISUAL

Additional transmission line installation and wind energy development from the Proposed Project would incrementally increase cumulative effects on the visual landscape in the Proposed Project counties caused by the addition of man-made elements to a landscape that is primarily natural or agricultural. As the number or density of tall, man-made structures increased in the local rural counties, it is possible that viewer sensitivity would also increase. The significance of the visual changes would vary according to the location of the wind project and the perceptions of the viewers.

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6 Unavoidable Adverse Impacts

Unavoidable adverse impacts are those that would occur after implementation of all incorporated BMPs, APMs and mitigation measures. Unavoidable adverse impacts do not include temporary or permanent impacts which would be mitigated.

The Applicants and Western have committed to implementing BMPs and APMs to minimize or eliminate potential impacts from constructing and operating the Proposed Project. If additional impacts are identified through other Federal, State or County permitting processes, the Applicants would develop appropriate mitigation measures in consultation with the requesting agency (*i.e.*, USFWS, USACE). Additional mitigation identified will be disclosed in the FEIS.

Constructing and operating the Proposed Project would unavoidably convert less than 0.5 percent of available farmland within the Proposed Project boundary. Loss of this agricultural farmland would have a minimal effect on the overall agricultural production in the area.

Constructing, operating and maintaining the Proposed Project may result in unavoidable adverse impacts to biological resources and cultural resources as described below. The Proposed Project would have a less than significant impact on the other resource areas as identified in **Chapter 4**; although identified as less than significant, unavoidable impacts to land use and visual resources are also discussed below.

Some biological resources would be lost due to the construction and operation of the Proposed Project. Construction of the Proposed Project Components would result in the permanent loss of a small amount of native vegetation and wildlife habitat. Operation of the Proposed Project would likely result in avian and bat mortalities. A BA is being prepared under Section 7 of the ESA for Federally-listed species. Impacts will be determined in the BA and findings will be summarized in the FEIS. The agencies will follow USFWS recommendations provided during the Section 7 consultation process.

Unavoidable adverse impacts to cultural resources, such as prehistoric properties, historic properties, and cultural landscapes, cannot be determined until the results of the Class III Survey and TCP Survey are completed. A MOA is being developed among Western, RUS, SHPO, affected Federal agencies, Applicants, and all interested Native American Tribes in conjunction with preparation of the EIS. The preferred mitigation measure is to avoid identified sites; however, the MOA would provide an agreement among the parties for the treatment of the unavoidable adverse impacts. Compliance with the MOA provisions would ensure that Section 106 requirements are met.

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7 Irreversible and Irretrievable Commitments of Resources

This section describes the irreversible and irretrievable commitments of resources associated with implementing the Proposed Project. An “irreversible commitment of resources” occurs when, once committed to the Proposed Project, the resource would continue to be committed throughout the life of the Proposed Project. An "irretrievable commitment of resources" refers to those resources that, once used, consumed, destroyed or degraded during construction, operation, or decommissioning of the Proposed Project, would cause the resource to be unavailable for use by future generations. Examples of irretrievable types of resources include nonrenewable resources, such as minerals and cultural resources, as well as renewable resources that would be unavailable for the use of future generations such as loss of production, harvest, or habitat.

If wind turbines are not upgraded, upon termination of operations, the Applicants have a contractual obligation to the landowners to remove the wind facilities, including foundations to a depth of four feet. The Applicants also have an obligation to restore the area to a condition reasonably similar to the condition of the surrounding soil. The Applicants may explore alternative methods to accomplish decommissioning of the Proposed Project at the time that this activity approaches. Decommissioning activities would be conducted in compliance with applicable rules and regulations.

Constructing and operating the Proposed Project Components would constitute an irreversible commitment of land, soil and vegetation for the life of the Proposed Project. The area of the underground collector and communication systems would be revegetated. While the Winner Alternative would require a slightly larger use of land, soil and vegetation, the commitments of these resources would be similar for either of the proposed alternatives.

Constructing the wind turbines and transmission structures would remove a minimal amount of agricultural lands from production and is an irreversible and irretrievable commitment of farmland. The Proposed Project would result in few changes to existing agricultural practices because farming and grazing would continue in and around the wind turbines and other Proposed Project Components.

Some biological resources would be lost due to the construction and operation of the Proposed Project. Construction of the Proposed Project Components would result in the permanent loss of a small amount of native vegetation and wildlife habitat. Operation of the wind farm would likely result in avian and bat mortalities. A BA is being prepared under Section 7 of the ESA for Federally-listed species. Findings of the BA will be summarized in the FEIS.

Cultural resources are nonrenewable resources. Irretrievable commitments of cultural resources, such as prehistoric properties, historic properties and cultural landscapes, cannot be determined until the results of the Class III Survey and TCP Survey are completed. A MOA is being developed among Western, RUS, SHPO, affected Federal agencies, Applicants, and interested Native American Tribes in conjunction with preparation of the EIS. The preferred mitigation measure is to avoid identified sites; however, the MOA would provide an agreement among the parties for the treatment of the unavoidable adverse impacts. Compliance with the MOA provisions would ensure that Section 106 requirements are met.

9 Consultation and Coordination

9.1 AGENCIES AND PERSONS CONTACTED/ CONSULTED

Western and RUS, as co-lead Federal Agencies, have consulted with Federal, State, and local agencies and Native American groups regarding the potential alternatives for the Proposed Project. The following is a list of contacts that were made during preparation of this DEIS.

Federal Agencies

Bureau of Indian Affairs – Great Plains Office
Federal Emergency Management Agency
Federal Highway Administration
National Park Service – Lewis and Clark National Historic Trail
Natural Resources Conservation Service
U.S. Army Corps of Engineers – South Dakota Regulatory Office
U.S. Department of Agriculture – Farm Service Agency, Jerauld County
U.S. Department of Agriculture – Farm Service Agency, Lyman County
U.S. Department of Energy
U.S. Department of the Interior – Office of Environmental Policy and Compliance
U.S. Environmental Protection Agency Region 8
U.S. Environmental Protection Agency – Head Quarters in Washington D.C.
U.S. Fish and Wildlife Service – Ecological Services Field Office
U.S. Fish and Wildlife Service – Lake Andes Wetland Management District
U.S. Fish and Wildlife Service – Huron Wetland Management District
U.S. Forest Service – Black Hills National Forest
U.S. Forest Service – Nebraska & Samuel R. McKelvie National Forests
U.S. Forest Service – Fort Pierre National Grassland
U.S. Forest Service – Buffalo Gap National Grassland
U.S. Forest Service – Oglala National Grasslands
U.S. Geological Survey, Northern Prairie Wildlife Research Center
U.S. Geological Survey, South Dakota State University

State Agencies

South Dakota Aeronautics Commission
South Dakota Department of Agriculture
South Dakota Department of Environment and Natural Resources
South Dakota Department of Health
South Dakota Department of Transportation
South Dakota Game, Fish, and Parks
South Dakota Game, Fish, and Parks – National Heritage Program

South Dakota Highway Patrol
South Dakota Indian Affairs Commission
South Dakota Public Utilities Commission
South Dakota State Historic Preservation Office
South Dakota State Historical Society
South Dakota State Land Department
South Dakota Transmission Authority

Local Agencies

Aurora County
Aurora County Board of Commissioners
Brule County
Brule County Board of Commissioners
City of Chamberlain
City of Colome
City of Kimball
City of Plankinton
City of White Lake
City of Winner
Gregory County Board of Commissioners
Jerauld County
Jerauld County Board of Commissioners
Town of Alpena
Town of Wessington Springs
Tripp County
Tripp County Board of Commissioners

Organizations

Basin Electric Power Cooperative
Ducks Unlimited
Sierra Club
The Nature Conservancy
Wessington Springs Area Development Corporation

Elected Officials

South Dakota Governor – Honorable Mike Rounds
South Dakota Senator – Honorable Tim Johnson
South Dakota Senator – Honorable John Thune
South Dakota U.S. House of Representatives – Representative Stephanie Herseth

Native American Tribes and Communities

Cheyenne River Sioux Tribe
Crow Creek Sioux Tribe
Flandreau Santee Sioux Executive Committee
Fort Peck Sioux and Assiniboine Tribe
Lower Brule Sioux Tribe
Lower Sioux Indian Community
Oglala Sioux Tribe

Rosebud Sioux Tribe of Indians
Santee Sioux Tribe of Nebraska
Sisseton-Wahpeton Oyate
Spirit Lake Tribal Council
Standing Rock Sioux Tribe
Three Affiliated Tribes Business Council
Turtle Mountain Band of Chippewa
Upper Sioux Indian Community
Wahpetkute Band of the Dakota
Yankton Sioux Tribe
South Dakota State Historical Society

9.2 INDIVIDUALS TO RECEIVE THE EIS

In addition to the Federal, State, and local agencies and Native American groups listed in **Section 9.1**, the DEIS has been distributed to the following individuals:

Individuals

E. Bailey
K. & S. Bradwisch
G. Brodkorb
B. Brozik
E. Brumbaugh
B. & P. Cerny
R. Clifford
R. & K. Demers
R. Hartog
G. Higgins, Jr.
G. Higgins, Sr.
V. & G. Hoing
H. Hotchkiss
K. & K. Janouselo
K. & W. Kayl
J. Keierleber
R. Kovacevich
R. & K. Kreinbuhl
B. Kroupa
M. LaPointe
P. Licht
B. Lindbloom
R. & G. Meier
D. & M. Moerike
L. Nelson
E. Odenbach
J. Patmore
R. Pearson
K. Perrin
J. Peters
G & O. Peterson
W. S.
D. Salmen
M. Schochenmaier
P.Seppanen
V. Svoboda
D. & C. Thomas
V. Vanderhule
D. Vaughn
J. Waterbury
D. Weiland
L. & A. Wihelmsen
L. & F. Woods

Copies of the DEIS have also been provided to the following locations and are available for public review.

Cozard Memorial Library in Chamberlain – Brule County
Kimball Public Library – Brule County
Plankinton City Library – Aurora County
Winner Public Library – Tripp County
Wessington Springs Carnegie Library – Jerauld County

Western Area Power Administration
Upper Great Plains Customer Service Region
South Dakota Maintenance Office
200 4th Street SW.
Huron, SD 57350

Rural Utilities Service
1400 Independence Ave. SW.
Mail Stop 1571, Room 2244
Washington DC 20250-1571

9.3 LIST OF PREPARERS

WESTERN CO- LEAD FEDERAL AGENCY		
Name/Title	**Education/Experience**	**Responsibility**
David Swanson – Technical	▪ B.A., Biological Sciences ▪ 32 years experience	NEPA compliance review
Liana G. Reilly, PMP – Project Manager	▪ B.S., Biological Psychology ▪ Masters of Environmental Management ▪ Masters of Public Health ▪ 8 years experience	Project management
Misti K. Schriner – Biologist	▪ B.S., Biology ▪ M.S., Environmental Science	Review of biological resources
Rod O'Sullivan – Environmental Protection Specialist		Project management
Stephen Tromly – Tribal Energy Program Manager	▪ B.S., Resource Conservation, MA Anthropology ▪ 19 years experience	Cultural resources

RUS CO-LEAD FEDERAL AGENCY		
Name/Title	**Education/Experience**	**Responsibility**
David Hui	▪ B.S., Electrical Engineering ▪ 20 years experience	Purpose and need, engineering review
Dennis Rankin – Project Manager/ Environmental Protection Specialist	▪ B.A., Biology ▪ M.S., Biology ▪ 32 years experience	Avian impacts
Laura Dean - Archeologist, Federal Preservation Officer	▪ B.S., Anthropology ▪ B.A., Anthropology ▪ Ph.D., Archeology ▪ 30 years experience	Cultural resources, Section 106 compliance
Richard Fristik - Senior Environmental Protection Specialist	▪ B.S., Wildlife & Fisheries Science ▪ M.S., Wildlife Management ▪ 20 years experience	ESA Section 7 consultation
Steve Slovikosky	▪ B.S., Electrical Engineering ▪ 32 years experience	Transmission/ engineering review

USFWS COOPERATING FEDERAL AGENCY		
Name/Title	**Education/Experience**	**Responsibility**
Mark Heisinger – Wildlife Refuge Specialist	▪ B.S. Wildlife Biology ▪ 32 years experience	Cooperating agency, considering refuge lands in Aurora, Brule and Tripp counties
Sandra Uecker – Wildlife Refuge Manager	▪ B.S. Wildlife Biology ▪ 22 years experience	Cooperating agency, considering refuge lands in Jerauld County

CONSULTANTS FOR THE EIS		
Name/Title	**Education/Experience**	**Responsibility**
Jason Ramsey – Senior GIS Analyst	▪ M.S., GIS ▪ B.A., Anthropology ▪ 6 years experience	Geospatial analysis, map generation
Jessica Wilton – Project Manager	▪ B.A, Biology ▪ 6 years experience	Project management, technical editing, land use, visual resources, noise, biological resources, socioeconomics and environmental justice, cumulative effects
Jodi Strohmayer, RPA – Archaeologist	▪ M.S., GIS & Spatial Analysis in Archaeology ▪ B.A., Anthropology ▪ 6 years experience	Land use, visual resources, air quality, noise, geology and seismicity, cultural resources, socioeconomics and environmental justice, public health and safety, transportation, cumulative effects
Joe Gregory – Senior GIS Analyst	▪ M.S., GIS ▪ B.S., Anthropology ▪ 6 years experience	Geospatial analysis, map generation
Kenda Pollio – Project Manager	▪ B.S., Environmental/Urban & Regional Planning ▪ M.A., Political Science – International Environmental Policy ▪ 14 years experience	Project management
Larry Killman – Principal	▪ 30 years experience	Project management, technical input, land use, water resources
Molly Cresto – Assistant Project Manager	▪ M.S., Science Technology and Policy (expected 2010) ▪ Graduate Certificate in Sustainable Technology Management ▪ B.S., Plant Biology Environmental Science & Ecology ▪ 6 years experience	Project management, technical editing, biological resources, land use, visual resources, transportation, socioeconomics and environmental justice, cumulative effects
Pat Golden – Senior Biologist	▪ B.A., Environmental, Population, Organismic Biology ▪ 14 years experience	Biological resources, Section 7 consultation
Sarah Bresnan – Scientist	▪ B.S., Plant Biology, Environmental Science and Ecology ▪ 3 years experience	Biological resources
Sheila Logan, P.E. – Senior Project Manager	▪ B.S., Civil and Environmental Engineering ▪ Graduate work, Civil and Environmental Engineering ▪ Registered Professional Engineer in AZ ▪ 16 years experience	Geology and soils, water resources, public health and safety, technical editing
Trish Mitchell, RPA – Senior Project Archeologist	▪ M.S., Anthropology ▪ 23 years experience	Cultural resources

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10 Disclosure Statement

Organizational Conflict of Interest Representation Statement

I hereby certify as a representative of my organization that, to the best of my knowledge and belief, no facts exist relevant to any past, present or currently planned interest or activity (financial, contractual, personal, organizational or otherwise) that relate to the proposed work; and bear on whether I or the organization has a possible conflict of interest with respect to (1) being able to render impartial, technically sound, and objective assistance or advice; or (2) being given an unfair competitive advantage.

Signature: Larry Killman

Date: January 8, 2010

Name: Larry Killman

Title: Principal

Organization: Tierra Environmental Consultants, LLC

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12 Glossary

This chapter contains a glossary of words, legislative terms and regulatory requirements used in this DEIS.

Administrative Rule (AR)	Administrative rules officially proclaim the State of South Dakota's regulations and have the force of law. Administrative rules and regulations elaborate or detail the requirements of a law or policy.
Aesthetics	Referring to the perception of beauty.
Affected environment	Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action.
Air pollutant	Generally, an airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated or for which maximum guideline levels have been established due to potential harmful effects on human health and welfare.
Air Quality Standards	The level of pollutants prescribed by regulation that may not be exceeded during a specified time in a defined area.
Alluvial deposits	Deposits of earth, sand, gravel and other materials carried by moving surface water deposited at points of weak water flow.
Ambient air	Any unconfined portion of the atmosphere; open air, surrounding air. That portion of the atmosphere, external to buildings, to which the general public has access.
American Wind Energy Association (AWEA)	National trade association representing wind power project developers, equipment suppliers, service providers, parts manufacturers, utilities, researchers, and others involved in the wind industry.
Anabat	A system to identify and survey bats by detecting and analyzing their echolocation calls.
Applicants	Basin Electric Power Cooperative and PrairieWinds SD1, Incorporated
Aquifer	A body of rock or sediment in a formation, group of formations, or part of a formation that is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

Archaeological Resources Protection Act	A Federal law, passed in 1979 (16 USC 1B, Pub. L. 96-95), to protect archaeological resources on public and Indian lands.
Archaeological sites (resources)	Any location where humans have altered the terrain or discarded artifacts during either prehistoric or historic times.
Archaeology	A scientific approach to the study of human ecology, cultural history, and cultural process.
Area of potential effects (APE)	The area in which disturbance to cultural resources may occur and within which a systematic cultural resource inventory is required.
Artifact	An object produced or shaped by human workmanship of archaeological or historical interest.
Attainment area	An area which the U.S. Environmental Protection Agency (EPA) has designated as being in compliance with one or more of the National Ambient Air Quality Standards (NAAQS) for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. Any area may be in attainment for some pollutants but not for others.
Average daily traffic (ADT)	The average volume of vehicles at a given point or section of highway over a 24-hour period.
Avian monitoring study	A study done to characterize and monitor the quality of avian species. Avian monitoring studies are used in the preparation of impact assessments, as well as in many circumstances in which human activities carry a risk of harmful effects on avian species natural environment.
Avian Power Line Interaction Committee	Committee that works in partnership with other utilities, resource agencies and the public to develop and provide educational resources, identify and fund research, develop and provide cost-effective management options, and serve as the focal point for avian interaction utility issues.
Bald and Golden Eagle Protection Act (BGEPA)	Law that provides for the protection of the Bald Eagle and the Golden Eagle by prohibiting the taking, possession and commerce of such birds (16 U.S.C. 668-668d, 54 Stat. 250).
Biological Assessment (BA)	An evaluation of potential effects of a proposed project on proposed, endangered, threatened, and sensitive animal and plant species and their habitats. Information prepared by, or under the direction of, a Federal agency to determine whether a proposed action is likely to adversely affect listed species or designated critical habitat, jeopardize the continued existence of species that are proposed for listing, or adversely modify proposed critical habitat.

Board of County Commissioners	A group of elected officials charged with administering the policies and regulations of county government.
Bounding	A credible upper limit to consequences or impacts.
Breaker	A switching device that is capable of closing or interrupting an electrical circuit under over-load or short-circuit conditions as well as under normal load conditions.
Bus	A set of two or more electrical conductors that serve as common connections between load circuits and each of the phases (in alternating current systems) of the electric power source.
Candidate species	A species of plant or animal for which there is sufficient information to indicate biological vulnerability and threat, and for which proposing to list as “threatened” or “endangered” is or may be appropriate.
Capability	The maximum load that a generator, turbine, transmission circuit, apparatus, station, or system can supply under specified conditions for a given time interval, without exceeding approved limits of temperature and stress.
Capacity	The load for which a generator, turbine, transformer, transmission circuit, apparatus, station, or system is rated. Capacity is also used synonymously with capability.
Carbon dioxide (CO_2)	A chemical compound composed of two oxygen atoms covalently bonded to a single carbon atom. It is a gas at standard temperature and pressure and exists in Earth's atmosphere in this state. CO_2 is also recognized as the most prominent greenhouse gas.
Carbon monoxide (CO)	A colorless, odorless gas that is toxic if breathed in high concentrations over a period of time. It is formed as the product of the incomplete combustion of hydrocarbons (fuel).
Class I, II and III Areas	Area classifications, defined by the Clean Air Act, for which there are established limits to the annual amount of air pollution increase. Class I areas include international parks and certain national parks and wilderness areas; allowable increases in air pollution are very limited. Air pollution increases in Class II areas are less limited, and are least limited in Class III areas. Areas not designated as Class I start out as Class II and may be reclassified up or down by the State, subject to Federal requirements.
Clast	A rock fragment or grain resulting from the breakdown of larger rocks.

Clean Air Act (CAA)	(42 U.S.C. 7401 *et seq.*) Establishes (1) national air quality criteria and control techniques (Section 7408); (2) NAAQS (Section 7409); (3) State implementation plan requirements (Section 4710); (4) Federal performance standards for stationary sources (Section 4711); (5) National Emission Standards for Hazardous Air Pollutants (NESHAP) (Section 7412); (6) applicability of CAA to Federal facilities (Section 7418), *i.e.*, Federal agency must comply with Federal, State, and local requirements respecting control and abatement of air pollution, including permit and other procedural requirements, to the same extent as any person; (7) Federal new motor vehicle emission standards (Section 7521); (8) regulations for fuel (Section 7545); (9) aircraft emission standards (Section 7571).
Clean Water Act (CWA)	(33 U.S.C. 1251 *et seq.*) Restores and maintains the chemical, physical, and biological integrity of the nation's waters.
Code of Federal Regulations (CFR)	All Federal regulations in force are published in codified form in the Code of Federal Regulations.
Colluvium	A loose deposit of rock debris accumulated through the action of gravity at the base of a cliff or slope.
Community (biotic)	All plants and animals occupying a specific area under relatively similar conditions.
Conditional Use Permit	A permit issued by a city, county, or other administrative entity to consider special uses which may be essential or desirable to a particular community, but which are not allowed as a matter of right within a particular zoning district or zoning ordinance. A conditional use permit can provide flexibility in planning, allowing, with conditions, a special use of property that is the public interest.
Conservation	A reduction in electric power consumption as a result of increases in the efficiency of energy use, production, or distribution.
Conservation Reserve Program (CRP)	A cost-share and rental payment program under the U.S. Department of Agriculture (USDA) administered by the Farm Service Agency. Technical assistance for CRP is provided by the USDA Forest Service and the USDA Natural Resources Conservation Service (NRCS). The CRP program encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filter strips, or riparian buffers.

Council on Environmental Quality (CEQ)	Established by the National Environmental Policy Act (NEPA), the CEQ consists of three members appointed by the President. A CEQ regulation (Title 40 CFR 1500-1508, as of July 1, 1986) describes the process for implementing NEPA, including preparation of environmental assessments and environmental impacts statements, and the timing and extent of public participation.
Criteria pollutants	An air pollutant that is regulated by the NAAQS. The EPA must describe the characteristics and potential health and welfare effects that form the basis for setting or revising the standard for each regulated pollutant. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter.
Critical habitat	Habitat identified as essential to the conservation of a threatened or endangered species, and which may require special management considerations or protection.
Cultural resources	Districts, sites, structures, and objects and evidence of some importance to a culture, a subculture, or a community for scientific, traditional, religious, and other reasons. These resources and relevant environmental data are important for describing and reconstructing past lifeways, for interpreting human behavior, and for predicting future courses of cultural development.
Cumulative impact	The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
Customer	Any entity or entities purchasing power from the power generator or distributor provider.
Day-night average sound level (L_{dn})	The average noise level over a 24 hour period.
Decibel (dB)	A unit for expressing the relative intensity of sounds on a logarithmic scale from 0 for the average least perceptible sound to about 130 for the average level at which sound causes pain to humans. For traffic and industrial noise measurements, the A-weighted decibel (dBA), a frequency-weighted noise unit, is widely used. The A-weighted decibel scale corresponds approximately to the frequency response of the human ear and thus correlates well with loudness.

Decommissioning	The process to remove the Proposed Project Components, or portions thereof, from service. Decommissioning may include decontamination, dismantling, shipment and final disposition of project components, and site rehabilitation, in compliance with applicable rules and regulations.
Demand	The rate at which energy is used at a given instant or averaged over a designated period of time.
Dendritic	Stream pattern resembling the branching pattern of blood vessels or tree branches.
Deposition	In geology, the laying down of potential rock-forming materials; sedimentation. In atmospheric transport, the settling out on ground and building surfaces of atmospheric aerosols and particles ("dry deposition") or their removal from the air to the ground by precipitation ("wet deposition" or "rainout").
Drinking water standards	The prescribed level of constituents or characteristics in a drinking water supply that cannot be exceeded legally.
Ecology	A branch of science dealing with the interrelationships of living organisms with one another and with their nonliving environment.
Ecosystem	Living organisms and their non-living (abiotic) environment functioning together as a community.
Effects (impacts)	As used in NEPA documentation, the terms effects and impacts are synonymous. Effects can be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.
Elevation	Height in feet above mean sea level.
Eligibility	The criteria of significance in American history, architecture, archeology, engineering, and culture. The criteria require integrity and association with important people or events, distinctiveness for any of a variety of reasons, or importance because of information the property does or could hold.

Eligible cultural resource	A cultural resource that has been evaluated and reviewed by an agency and the State Historic Preservation Officer and recommended as eligible for inclusion in the National Register of Historic Places, based on the criteria of significance.
Electric and magnetic fields (EMF)	The invisible lines of force associated with the production, transmission, and use of electric power, such as those associated with high-voltage transmission lines, secondary power lines, and home wiring and lighting. EMFs are present around any electrical device.
Emission Standards	Requirements established by a State, local government, or the EPA Administrator that limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis.
Emissions	Pollution discharged into the atmosphere from smoke stacks, other vents, and surface areas of commercial or industrial facilities, residential chimneys, and vehicle exhausts.
Endangered species	Plants or animals that are in danger of extinction through all or a significant portion of their range.
Endangered Species Act of 1973	(16 U.S.C. 1531 *et seq.*) Provides for listing and protection of animal and plant species identified as in danger, or likely to be in danger, or extinction throughout all or a significant portion of their range. Section 7 places strict requirements on Federal agencies to protect listed species.
Energy	That which does or is capable of doing work. It is measured in terms of the work it is capable of doing; electric energy is usually measured in kilowatt-hours.
Environmental Impact Statement (EIS)	The detailed written statement that is required by Section 102(2)(C) of NEPA for a proposed major Federal action significantly affecting the quality of the human environment.
Environmental Justice	Identification of potential disproportionately high and adverse impacts on low-income and/or minority populations that may result from proposed Federal actions (required by Executive Order 12898).
Eolian	Sediment materials eroded and deposited by the wind.
Erosion	Wearing away of soil and rock by weathering and the actions of surface water, wind, and underground water.
Ethnographic	Information about cultural beliefs and practices.
Facility	The wind power generating components of the Proposed Project.

Farmland Protection Policy Act	A statute enacted in 1981 by the USDA to ensure that significant agricultural lands are protected from conversion to nonagricultural uses.
Federal Aviation Administration	An agency that regulates civil aviation to promote safety, encourages and develops civil aeronautics including new aviation technology, develops and operates a system of air traffic control and navigation for both civil and military aircraft, researches and develops the National Airspace System and civil aeronautics, develops and carries out programs to control aircraft noise and other environmental effects of civil aviation, and regulates U.S. commercial space transportation.
Federal Energy Regulatory Commission (FERC)	An independent agency that regulates the interstate transmission of electricity, natural gas, and oil. FERC also reviews proposals to build liquefied natural gas (LNG) terminals and interstate natural gas pipelines as well as licensing hydropower projects.
Floodplain	The lowlands adjoining inland and coastal waters and relatively flat areas, including at a minimum that area inundated by a 1-percent or greater chance flood in any given year. The base floodplain is defined as the 100-year (1.0 percent) floodplain. The critical action floodplain is defined as the 500-year (0.2 percent) floodplain.
Fluvial	Sediment materials eroded and deposited by the action of a stream.
Formation	In geology, the primary unit of formal stratigraphic mapping or description. Most formations possess certain distinctive features.
Game Production Areas (GPA)	Areas owned and managed by the South Dakota Department of Game, Fish and Parks for game production and public hunting.
Gauss (G)	The unit most commonly used in the United States to measure magnetic fields.
Generation	The act or process of producing electricity from other forms of energy.
Generator	A machine that converts mechanical energy into electrical energy.
Glaciofluvial	Sediments deposited by streams fed by melting glaciers.

Grassland Easements	A legal agreement signed with the United States of America, through the U.S. Fish and Wildlife Service that pays to permanently keep land in grass. This restriction is to help grassland nesting species, such as ducks and pheasants, complete their nesting before the grass is disturbed.
Groundwater	Water within the earth that supplies wells and springs.
Hazardous Air Pollutants	Air pollutants that are not covered by ambient air quality standards, but that may present a threat of adverse human health effects or adverse environmental effects.
Hazardous waste	A category of waste regulated under the Resource Conservation and Recovery Act (RCRA). To be considered hazardous, a waste must be a solid waste under RCRA and must exhibit at least one of four characteristics described in 40 CFR 261.20 through 40 CFR 261.24 (*i.e.*, ignitability, corrosivity, reactivity, or toxicity) or be specifically listed by the EPA in 40 CFR 261.31 through 40 CFR 261.33.
Historic properties	Resources of national, State, or local significance in American history, architecture, archaeology, engineering, or culture, and worthy of preservation.
Hydric soils	Soils containing considerable moisture.
Hydrophytic	Growing wholly or partially in water or having or characterized by excessive moisture.
Hydrophytic vegetation	Vegetation adapted to an aquatic or very wet environment.
Impacts (effects)	An assessment of the meaning of changes in all attributes being studied for a given resource; an aggregation of all the positive and negative effects, usually measured using a qualitative and nominally subjective technique. In this EIS, as well as in the CEQ regulations, the word impact is used synonymously with the word effect.
Impaired waters	Under Section 303(d) of the Clean Water Act, States, territories, and authorized tribes are required to develop lists of impaired waters. These are waters that are too polluted or otherwise degraded to meet the water quality standards set by States, territories or authorized tribes. The law requires that these jurisdictions establish priority rankings for waters on the lists and develop total maximum daily loads for these waters. Total maximum daily loads are calculations of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

Indirect impacts	Impacts resulting from an action that are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
Infrastructure	The basic installations and facilities (e.g., roads, schools, power plants, transportation, communication systems) on which the continuance and growth of a community or State are based.
Interested parties	Those groups or individuals that are interested, for whatever reason, in the project and its progress. Interested parties include but are not limited to private individuals, public agencies, organizations, customers, and potential customers.
Invertebrate	Animals characterized by not having a backbone or spinal column, including a wide variety of organisms such as insects, spiders, worms, clams, crayfish, *etc*.
K Factor (K)	Represents the potential for soil erosion accounting for several factors, including rainfall/runoff, slope length and steepness, cover management, and the physical properties of the soil itself.
Kame	A short ridge or mound of sand and gravel deposited during the melting of glacial ice.
Key Observation Point (KOP)	An element of the contrast rating system used by the Bureau of Land Management (BLM) to analyze the potential visual impact of proposed projects and activities. The rating is done from the most critical viewpoints, or Key Observation Points. Factors that should be considered in selecting KOPs are: angle of observation, number of viewers, length of time the project is in view, relative project size, season of use, and light conditions.
Kilovolt (kV)	The electrical unit of power that equals 1,000 volts.
Landowner agreements	A lease agreement established between the Applicants and a private landowner for the construction of the Proposed Project. These leases would allow construction and operation of wind facilities for a negotiated term.
Large Generator Interconnection	The protocols established by Western for customers requesting an interconnection with a capacity greater than 20 MW.

Large Generator Interconnection Agreement (LGIA)	The agreement established between Western and an interconnection customer outlining the terms and provisions of the interconnection.
Lewis and Clark Interpretive Center (LCIC)	An educational center, managed by the USDA Forest Service, providing information to the public a personal sense of President Thomas Jefferson's vision of expanding America to the west. Information based toward the challenges faced by the Lewis and Clark expedition as they portaged the great falls of the Missouri River and explored the 'unknown', brings to life the daily experiences of the expedition and the environment and native peoples of the 'uncharted West.'
Lewis and Clark National Historic Trail (NHT)	Meriwether Lewis and William Clark traveled over a three-year period through lands that later became 11 States. Most of the trail follows the Missouri and Columbia Rivers. At 3,700 miles (5,950 km), it begins at Hartford, Illinois, and passes through portions of Missouri, Kansas, Iowa, Nebraska, South Dakota, North Dakota, Montana, Idaho, Oregon, and Washington. It is part of the National Trails System of the United States.
Lewis and Clark Trail Driving Route (LCTDR)	The LCTDR is a network of roads that generally tracks the Lewis and Clark NHT along the Missouri River and provides vistas as well as historic markers. The Lewis and Clark NHT extends more than 3,700 miles and includes the entire Missouri River from its headwaters in Montana to its confluence with the Mississippi River near St. Louis, Missouri.
Liter (L)	Unit of volume of the metric system.
Lithic	A stone artifact that has been modified or altered by human hands.
Load	The amount of electric power required at a given point on a system.
Loam	A rich, permeable soil composed of a mixture of clay, silt, sand, and organic matter.
Low-income population	A population that is classified by the U.S. Bureau of the Census as having an aggregated mean income level for a family of four that correlates to $13,359, adjusted through the poverty index using a standard of living percentage change where applicable, and whose composition is at least 25 percent of the total population of a defined area or jurisdiction.

Mammal	Animals in the class Mammalia that are distinguished by having self regulating body temperature, hair, and in females, milk-producing mammary glands to feed their young.
Megawatt (MW)	The electrical unit of power that equals 1 million watts or 1 thousand kilowatts.
Megawatt-hours (MWh)	A unit of energy. Energy in watt hours is the multiplication of power in watts and time in hours.
Mesic	Ecological term indicating characterized by, or adapted to a moderately moist habitat.
Meteorology	The science dealing with the dynamics of the atmosphere and its phenomena, especially relating to weather.
Microtesla (µT)	The Tesla is the internationally accepted scientific unit for measuring magnetic fields. Since a Tesla is very large, and the majority of magnetic field exposure is substantially lower, values typically reported and measured are in microtesla (µT) (or 1/1,000,000 of a Tesla).
Migratory Bird Treaty Act (MBTA)	Establishment of a Federal prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention for the protection of migratory birds or any part, nest, or egg of any such bird." (16 U.S.C. 703)
Miles per hour (mph)	The ratio of the distance traveled (measured in miles) to the time expended traveling that distance (measured in hours).
Milligauss (mG)	A unit of measurement for measuring magnetic fields. Since a Gauss is very large and the majority of magnetic field exposure is substantially lower, values typically reported and measured are in milligauss (mG) (1/1,000 of a Gauss).
Minority population	A population that is classified by the U.S. Bureau of the Census as African American, Hispanic American, Asian and Pacific American, American Indian, Eskimo, Aleut, and other non-White persons, whose composition is at least 25 percent of the total population of a defined area or jurisdiction.

Mitigation	The alleviation of adverse impacts on environmental resources by avoidance through project redesign or project relocation, by protection, or by adequate scientific study.
National Ambient Air Quality Standards (NAAQS)	Standards defining the highest allowable levels of certain pollutants in the ambient air. Because the EPA must establish the criteria for setting these standards, the regulated pollutants are called criteria pollutants.
National Environmental Policy Act (NEPA)	This Act (42 U.S.C. 4341, passed by Congress in 1975) established a national policy designed to encourage consideration of the influences of human activities (e.g., population growth, high-density urbanization, industrial development) on the natural environment. NEPA also established the CEQ. NEPA procedures require that environmental information be made available to the public before decisions are made. Information contained in NEPA documents must focus on the relevant issues in order to facilitate the decision-making process.
National Historic Preservation Act (NHPA)	The National Historic Preservation Act of 1966, as amended, recognized the nation's cultural and historical heritage, and established requirements for ensuring the protection of cultural resources considered significant at the local, State, and national levels (16 U.S.C. 470). The NHPA also provides for an expanded National Register of Historic Places (NRHP) to include districts, sites, buildings, structures, and objects significant to American history, architecture, archaeology, and culture. Section 106 requires that the President’s Advisory Council on Historic Preservation be afforded an opportunity to comment on any undertaking that adversely affects properties listed in, or eligible for listing in, the NRHP.
National Pollutant Discharge Elimination System Permit (NPDES)	Federal regulation (40 CFR Parts 122 and 125) that requires permits for the discharge of pollutants from any point source into the waters of the United States regulated through the Clean Water Act, as amended.
National Register of Historic Places (NRHP)	A list maintained by the Keeper (an individual who has been delegated by the National Park Service) of districts, sites, buildings, structures, and objects of prehistoric or historic local, State, or national significance. The list is expanded as authorized by Section 2(b) of the Historic Sites Act of 1935 (16 U.S.C. 462) and Section 101(a)(1)(A) of the National Historic Preservation Act of 1966, as amended.

National Renewable Energy Laboratory (NREL)	A national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.
National Wetlands Inventory (NWI)	A series of maps produced by U.S. Fish and Wildlife Service (USFWS) to show wetlands and deepwater habitats to illustrate reconnaissance level information on the location, type, and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology, and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.
Native American	A tribe, people, or culture that is indigenous to the United States.
Native American Graves Protection and Repatriation Act (NAGPRA)	A Federal law requiring Federal agencies and institutions that receive Federal funding to return Native American cultural items and human remains to their respective peoples. Cultural items include funerary objects, sacred objects, and objects of cultural patrimony.
Native vegetation	Plant life that occurs naturally in an area without agricultural or cultivation efforts. It does not include species that have been introduced from other geographical areas and have become naturalized.
Natural Resources Conservation Service	A USDA service that provides a partnership effort to help America's private land owners and managers conserve their soil, water, and other natural resources.
Nitrogen dioxide (NO_2)	A highly reactive toxic gas and one of the six criteria pollutants regulated by EPA through the NAAQS.
Noise	Unwanted or undesirable sound, usually characterized as being so loud as to interfere with, or be inappropriate to, normal activities such as communication, sleep, study or recreation.
Non-attainment area	An area that the EPA has designated as not meeting (that is, not being in attainment of) one or more of the NAAQS for criteria pollutants. An area may be in attainment for some pollutants, but not others.

Noxious weeds	Plant species that have been designated by State or national agricultural authorities as a plant that is injurious to agricultural and/or horticultural crops and/or humans and livestock. Most have been introduced into a foreign ecosystem either by accident or mismanagement, but some are also native species. Typically they are plants that are aggressive growing, multiply quickly, and adversely affect desirable plants, or are somehow injurious to livestock or humans either by contact or when ingested. They are a large problem in many parts of the world, greatly affecting areas of agriculture, forest management and other open lands.
Obligate species	Plant species that almost always occur in wetlands (*i.e.*, greater than 99 percent of the time).
Off-peak	Power that is generated during low-demand periods of the day, typically evenings and to a lesser extent, weekends. There is less demand for power during these times, thus more power is available in the marketplace at a lower cost.
On-peak	Power that is generated during high-demand periods of the day, typically mornings and evenings. Power generated during this time is generally more expensive because baseload power plants are fully operational and excess power in the marketplace is relatively scarce.
Open Access Transmission Service Tariff (Tariff)	A document (typically filed with a regulatory body) that sets forth the rates, terms, and conditions under which an interested entity can receive transmission service from an electric utility. Western's Tariff filed with FERC requires Western to offer its transmission lines for delivery of electricity when capacity is available.
Outwash	A broad, outspread flat or gently sloping deposit of sediment deposited by streams flowing away from a melting glacier.
Oyate	Native American word meaning *people* or *nation.*
Ozone	A molecule of three oxygen atoms bound together. In the stratosphere, ozone protects the earth from the sun's ultraviolet rays but in the lower levels of the atmosphere, ozone is considered an air pollutant.
Paleontology	The study of fossils.
Palustrine	All nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 parts per trillion.

Particulate matter (PM, PM10, and PM2.5)	Any finely divided solid or liquid material, other than uncombined water. A subscript denotes the upper limit of the diameter of particles included. Thus, PM10 includes only those particles equal to or less than 10 micrometers (0.0004 inch) in diameter; PM2.5 includes only those particles equal to or less than 2.5 micrometers (0.0001 inch) in diameter.
Peak capacity	The maximum capacity of a system to meet loads.
Peak demand	The highest demand for power during a stated period of time.
Permeability	The ability of rock or soil to transmit a fluid.
pH	A measure of the relative acidity or alkalinity of a solution, expressed on scale from 0 to 14, with the neutral point at 7.0. Acid solutions have pH values lower than 7.0, and basic (*i.e.* alkaline) solutions have pH values higher than 7.0. Because pH is the negative logarithm of the hydrogen ion (H+) concentration, each unit increase in pH value expresses a change of state of 10 times the preceding state. Thus, pH 5 is 10 times more acidic than pH 6, and pH 9 is 10 times more alkaline than pH 8.
Potential Impact Index (PII)	A scoring protocol used to evaluate the potential for wind development sites to affect plant and wildlife species.
Prairie Pothole Region (PPR)	An area of the northern Great Plains and midgrass and tallgrass prairies that contains thousands of shallow wetlands known as potholes. These potholes are the result of glacier activity in the Wisconsin glaciation, which ended approximately 10,000 years ago. The decaying ice sheet left behind depressions formed by the uneven deposition of till in ground moraines, and melting ice blocks which created kettle lakes. These depressions filled with water, creating the potholes.
Prehistoric	Of, relating to, or existing in times before written history. Prehistoric cultural resources are those that precede written records of the human cultures that produced them.
Presidential Executive Order 11988 (Floodplain Management)	Executive Order 11988 requires Federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

Presidential Executive Order 11990 (Wetlands Management)	Executive Order 11990 directs Federal agencies to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The order requires Federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided.
Presidential Executive Order 12088 (Federal Compliance with Pollution Control)	Executive Order 12088 requires all Federal agencies to be in compliance with environmental laws and fully cooperate with EPA, State, interstate, and local agencies to prevent, control, and abate environmental pollution.
Presidential Executive Order 12898 (Environmental Justice)	Executive Order 12898 directs Federal agencies to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.
Presidential Executive Order 13007 (Indian Sacred Sites)	Executive Order 13007 directs Federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites.
Presidential Executive Order 13112 (Invasive Weed Species)	Executive Order 13112 requires the prevention of the introduction of invasive species and provides for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.
Presidential Executive Order 13186 (Protection of Migratory Birds)	Executive Order 13186 directs executive departments and agencies to take certain actions to further implement the MBTA. Each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement a Memorandum of Understanding (MOU) with the USFWS that shall promote the conservation of migratory bird populations.
Prime farmland	Soil types with a combination of characteristics that make the soils particularly productive for agriculture.
Raptor	Birds of prey including various types of hawks, falcons, eagles, vultures, and owls.

Record of Decision (ROD)	A concise public document that records a Federal agency's decision(s) concerning a proposed action for which the agency has prepared, or cooperated in the preparation of an EIS. The ROD is prepared in accordance with the requirements of the CEQ NEPA regulations (40 CFR 1505.2).
Region of Influence (ROI)	The geographical region that would be expected to be affected in some way by a proposed action and alternatives.
Reliability	The ability of the power system to provide customers uninterrupted electric service, including generation, transmission, and distribution reliability.
Renewable Portfolio Standard	A provision stating that any load serving entity shall derive a percentage of its total retail energy sold from new solar resources or environmentally friendly renewable electricity technologies, whether that energy is purchased or generated by the seller.
Right-of-way	An easement for a certain purpose over the land of another use, such as a strip of land used for a transmission line, roadway, or pipeline.
Riparian	Of or pertaining to the bank of a river, stream, lake, or other water bodies.
Runoff	The portion of rainfall, melted snow, or irrigation water that flows across the ground surface and may eventually enter streams.
Safe Drinking Water Act	The principal Federal law in the United States that ensures safe drinking water for the public. Pursuant to the act, the EPA is required to set standards for drinking water quality and oversee all States, localities, and water suppliers who implement these standards.
Scoping	An early, open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.
Section 106 Process	Section 106 of the National Historic Preservation Act and its implementing regulations (36 CFR 800) require Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The purpose of the Section 106 process is to identify, evaluate, and protect cultural resources eligible for listing in the NRHP that may be affected by Federal actions or undertakings (16 U.S.C. §470 *et seq.).*

Sediment	Material deposited by wind or water.
Sedimentation	The process of deposition of sediment, especially by mechanical means from a state of suspension in water.
Sensitive species	Those plants and animals for which population viability is a concern, as shown by a significant current or predicted downward trend in populations or density and significant or predicted downward trend in habitat capability.
Socioeconomics	The social and economic condition in the study area.
Solid waste	In general, solid wastes are non-liquid, non-soluble discarded materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes include sewage sludge, agricultural refuse, demolition wastes, and mining residues.
South Dakota Ambient Air Quality Standards (SDAAQS)	The thresholds established and regulated for criteria air pollutants. The Department of Environment and Natural Resources (DENR) has adopted the NAAQS for the State air quality program.
South Dakota Codified Laws (SDCL)	Statutes, laws, and regulations established through the State's legislative process.
South Dakota Department of Game, Fish and Parks	The Department of Game, Fish and Parks conserves, manages, protects and enhances South Dakota's wildlife resources, parks, and outdoor recreational opportunities.
South Dakota State Historic Preservation Office	The State Historic Preservation Office manages the National Register of Historic Places program of the National Park Service in South Dakota. The program surveys, inventories, and registers historical properties; monitors State, Federal, and local government activities which affect cultural and historic resources; provides advice on preservation methods; promotes public education on historical properties; and supports municipal and county historic preservation commissions to advance the State's economic, social, and educational objectives.
Special Use Permit (SUP)	A permit issued under specific circumstances to regulate activities that may otherwise be prohibited.
Special-status species	Those species that have been identified as endangered, threatened, proposed, State species of special concern, or State protected.

Spill Prevention Control and Countermeasures Plan (SPCC)	A plan implemented to help prevent any discharge of oil into navigable waters or adjoining shorelines. As stipulated by EPA, SPCC plans are required for non-transportation facilities that have a total above-ground oil storage capacity of 1,320-gallons.
State Historic Preservation Officer	The official within each State, authorized by the State at the request of the Secretary of the Interior, to act as liaison for purposes of implementing the National Historic Preservation Act.
Step-up transformer	Transformer in which the energy transfer is from a low- to a high-voltage winding or windings. (Winding means one or more turns of wire forming a continuous coil for a transformer, relay, rotating machine, or other electric device.)
Storm Water Pollution Prevention Plan (SWPPP)	A plan required to be implemented for construction projects disturbing more than one acre of land. Implementation of a SWPPP is a requirement to obtain NPDES permit coverage for storm water discharges.
Stratigraphy	The study of rock strata, especially the distribution, deposition and age of sedimentary rocks.
Substation	A facility where electric energy is passed for transmission, transformation, distribution, or switching.
Sulfur dioxide (SO_2)	One of the six criteria pollutants regulated by EPA through the NAAQS.
Sulfur hexafluoride (SF_6)	A colorless, odorless gas considered by the Intergovernmental Panel on Climate Change to be one of the more potent greenhouse gases (GHGs) in the atmosphere. SF_6 is used in electrical equipment, such as circuit breakers.
Super long extreme (sle)	A technical specification of one of the proprietary wind turbines manufactured by General Electric.
Supervisory control and data acquisition (SCADA)	A software program used to communicate directly with individual wind turbines to monitor performance, report energy output, and trouble-shoot technical difficulties.
Surface water	All bodies of water on the surface of the earth and open to the atmosphere, such as rivers, lakes, reservoirs, ponds, seas, and estuaries.
Switchyard	Facility with circuit breakers and automatic switches to turn power on and off on different transmission lines. Switchyards are typically associated with substations.
Tesla (T)	The internationally accepted scientific unit for measuring magnetic fields.

Threatened species	Plant and wildlife species likely to become endangered in the foreseeable future.
Total suspended solids (TSS)	A measure of the amount of small, particulate solid pollutants that are suspended in water.
Traditional Cultural Property/Use Area	Areas of significance to the beliefs, customs, and practices of a community of people that have been passed down through generations.
Transformer	Its most frequent use in power systems is for changing voltage levels.
Transmission line	The structures, insulators, conductors and other equipment used to transfer electrical power from one point to another.
Trophic state index	A measure of eutrophication (increase in chemical nutrients resulting in increased productivity) of a body of water using a combination of measures of water transparency or turbidity, chlorophyll-a concentrations and total phosphorus levels.
U.S. Army Corps of Engineers (USACE)	A Federal Army construction management agency. Generally associated with dams, canals and flood protection in the United States, U.S. Army Corps of Engineers is involved in a wide range of public works support to the nation and the Department of Defense throughout the world. U.S. Army Corps of Engineers specializes in planning, designing, building, operating locks and dams, and environmental regulation and ecosystem restoration.
U.S. Code (USC)	The United States Code is the codification by subject matter of the general and permanent laws of the United States. It is divided by broad subjects into 50 titles and published by the Office of the Law Revision Counsel of the U.S. House of Representatives.
U.S. Environmental Protection Agency (EPA)	The independent Federal agency, established in 1970, that regulates Federal environmental matters and oversees the implementation of Federal environmental laws.
U.S. Fish and Wildlife Service (USFWS)	The U.S. Fish and Wildlife Service is the unit of the U.S. Department of the Interior dedicated to the management and preservation of wildlife. Units within the USFWS include: National Wildlife Refuge System, Migratory Birds program, Federal Duck Stamp, National Fish Hatchery System, Endangered Species Program and the Office of Law Enforcement.

Vertebrate	Animals that are members of the subphylum Vertebrata, including fishes, amphibians, reptiles, birds, and mammals, all of which are characterized by having a segmented bony or cartilaginous spinal column.
Volt	The unit of voltage or potential difference. It is the electromotive force which, if steadily applied to a circuit having a resistance of one ohm, will produce a current of one ampere.
Voltage	Potential for an electric charge to do work; source of an electric field.
Waterfowl Production Areas (WPAs)	Public lands purchased by the Federal government for the purpose of increasing the production of migratory birds, especially waterfowl.
Waters of the United States (WUS)	As defined by the Clean Water Act, waters of the United States applies only to surface waters, rivers, lakes, estuaries, coastal waters, and wetlands. Waters of the United States include all interstate waters, intrastate waters used in interstate and/or foreign commerce, tributaries of the above, territorial seas at the cyclical high tide mark, and wetlands adjacent to all the above.
Wetland	Land or areas exhibiting hydric soil concentrations saturated or inundated soil during some portion of the year, and plant species tolerant of such conditions.
Wetland Management District (WMD)	Public lands managed by the USFWS as part of the National Wildlife Refuge System to provide habitat for endangered species, migratory birds, and other wildlife and to provide places for people to learn about and enjoy wildlife.
Wind Resource Assessment Network (WRAN)	A network of 11 towers throughout South Dakota used for measuring wind speed and direction to allow for statistical verification of wind resources within the State.

Appendix A

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Appendix A

Scoping Materials

- Interagency and Scoping Meeting Materials
- Interagency Meeting Invitation Letters and Recipients
- Local Newspaper Notices
- Native American Tribe Letter and Recipient List
- Notice of Intent
- Post Card Scoping Advertisement

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South Dakota PrairieWinds Project Environmental Impact Statement

The NEPA Process

An Environmental Impact Statement (EIS) is being prepared under the direction of the U.S. Department of Energy (DOE), Western Area Power Administration (Western) and the U.S. Department of Agriculture, Rural Utilities Service (RUS) for the South Dakota PrairieWinds Project . The project proponent seeks an interconnection with Western and financing from RUS, and thus an EIS will be developed in accordance with National Environmental Policy Act (NEPA) requirements and agencies' implementing regulations.

Public involvement is part of the NEPA environmental review process. The public participation effort focuses on providing information to and gathering input from the public. You will have numerous opportunities to participate in the decision-making process as shown on the figure to the right.

How you can participate

- Attend a public meeting. The meeting will provide the opportunity to ask questions, express concern, and submit written comments.

- Participate and provide comments during scoping as well as during the public review of the EIS. The availability of the Draft EIS and Final EIS will be announced. If requested, you will be provided the Draft EIS and Final EIS for review when completed.

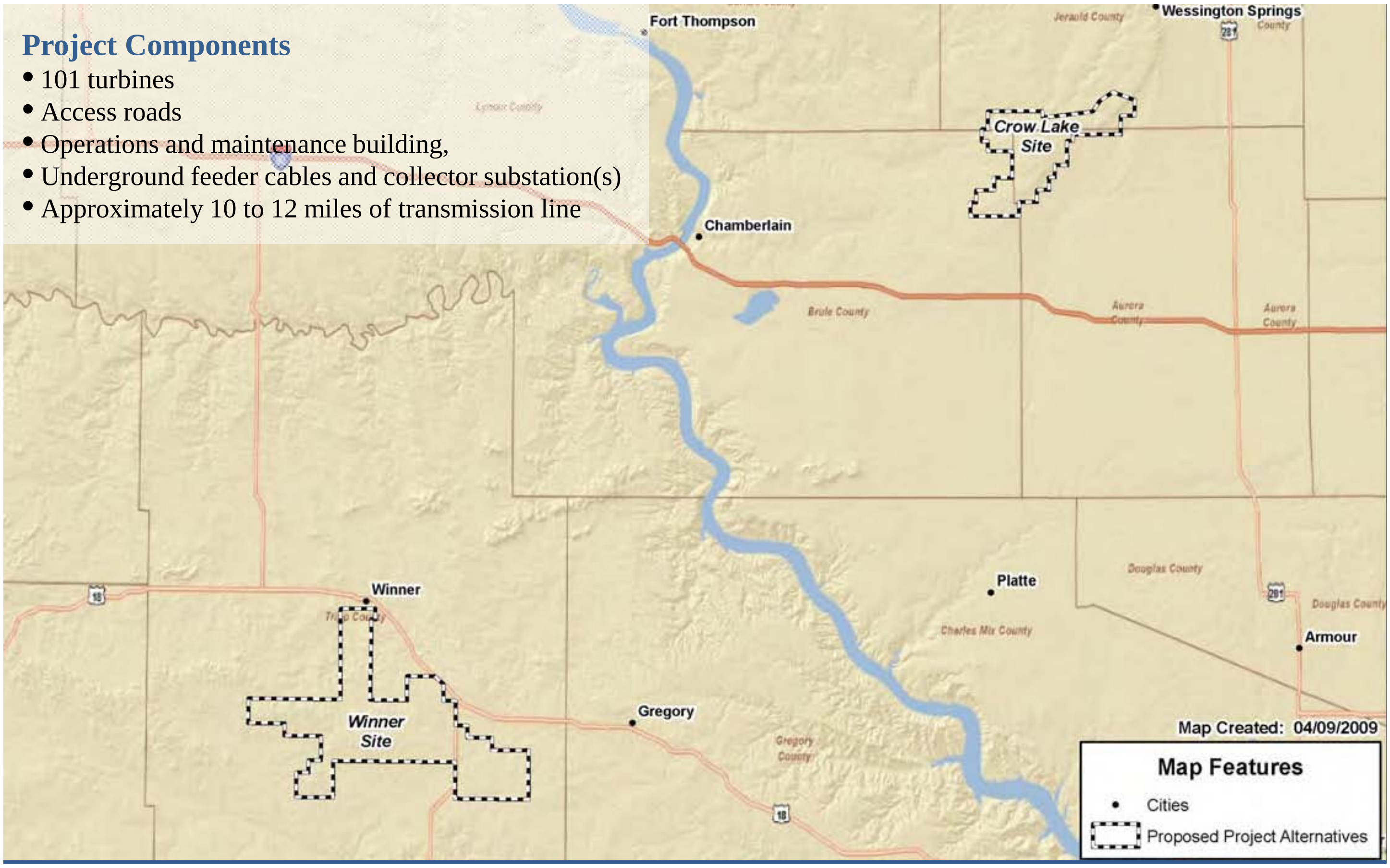
- Designate on a comment form that you would like to be kept informed of the ongoing progress of this project and be included on the mailing list.

For more information on the proposed project:

Call the Project Phone Number: (800) 336-7288
Send an e-mail to the Project E-mail: sdprairiewinds@wapa.gov
Visit the Project Website: http://www.wapa.gov/sdprairiewinds.htm

Project Components

- 101 turbines
- Access roads
- Operations and maintenance building,
- Underground feeder cables and collector substation(s)
- Approximately 10 to 12 miles of transmission line



Project Description

PrairieWinds SD1, Inc. (PrairieWinds), a wholly owned subsidiary of Basin Electric Power Cooperative (Basin Electric), is proposing to construct a new 151.5-megawatt (MW) wind energy facility at one of two locations in south-central South Dakota (see map to the right). Project components would include:

Power from the facility would be supplied to Basin Electric's customers through an interconnection with Western's transmission system. RUS is considering financing the project. Once environmental permitting is complete, and if the agency decisions are to go forward with the project, construction would begin Fall 2010/Winter 2010. Facility commercial operation is anticipated to begin in late 2010 or early 2011.

Project Purpose and Need

Incentives and regulations to encourage or require the generation of power from renewable or low environmental impact resources are being actively considered and/or implemented within the Basin Electric member service areas. A number of proposals for national Renewable Portfolio Standards (RPS) are pending in Congress.

Basin Electric's Participation: With members in nine states, Basin Electric recognizes the need for additional renewable energy capacity to service forecasted member load growth demands and to meet state mandated RPS. A 151.5-MW wind energy facility was determined to be the least-cost renewable resource option to satisfy these requirements.

PrairieWinds's Participation: A subsidiary of Basin Electric, and the project applicant. To be the owner and operator of the proposed project.

RUS's Participation: Co-lead agency for the EIS process, providing oversight of the NEPA process and preparation of the EIS. They are also considering granting financing assistance.

Western's Participation: Co-lead agency for the EIS process, providing oversight of the NEPA process and preparation of the EIS. They are also considering approval of an interconnection request.

Note, that consultation is occurring and Native American Tribes and agencies with jurisdiction or special expertise have been invited to be cooperating agencies

South Dakota PrairieWinds Project Environmental Impact Statement
Scoping Process

What is Scoping?

The Council on Environmental Quality's scoping definition (Sec. 1501.7) states:

> *There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process shall be termed scoping.*

Scoping is the process by which Federal agencies invite other agencies, organizations, and the public to provide input on the scope of a project. More specifically, it is the process that Federal agencies utilize to get input on the issues and effects related to a proposed action and alternatives. The items identified are then addressed in an Environmental Impact Statement (EIS). The EIS is addressed in accordance with National Environmental Policy Act (NEPA) requirements and agencies' implementing regulations.

Scoping and the South Dakota PrairieWinds Project:

Western Area Power Administration (Western), an agency within the U.S. Department of Energy; Rural Utilities Service (RUS), an agency within the U.S. Department of Agriculture (USDA); are conducting scoping for the proposed South Dakota PraireWinds Project. Throughout the scoping period, written comments may be submitted to the address below. As a part of the scoping process, two scoping meetings are being held for this project. At these meetings, Western, RUS and PrairieWinds SD1, Inc. (PrairieWinds, the Applicant) representatives will be available for one-on-one discussions, to provide information about the proposed project, answer questions, and take verbal and written comments from interested parties.

Ways to Provide Comments:

We would appreciate any comments you have concerning the proposed project. We would like to ensure that important environmental concerns are addressed and that natural resources and places of interest within the project area are considered in the EIS. Comments on the project scope and alternatives should be received by **May 15, 2009**, to be considered in defining the scope for the Draft EIS. This is not your only opportunity to submit comments on the EIS. There will be additional opportunities for the public to provide input during the development of the EIS. Comments could be submitted through the project's web address, or sent by letter, fax or e-mail. Written comments on the scope of the EIS should be addressed to **Ms. Liana Reilly**, at the address listed below.

Ms. Liana Reilly
Document Manager
Western Area Power Administration
Corporate Services Office, A7400
P.O. Box 281213
Lakewood, Colorado 80228-8213
Fax: (720) 962-7263

Call the Project Phone Number: (800) 336-7288
Send an e-mail to the Project E-mail: sdprairiewinds@wapa.gov

Visit the Project Website: http://www.wapa.gov/sdprairiewinds.htm

How to Receive Additional Information:

For more information about the project, or if you would like to be included on the Project mailing list and/or to receive copies of the Draft and Final EIS, please provide your contact information to Ms. Liana Reilly, at the address above. For information on RUS financing please contact Mr. Dennis Rankin, Project Manager, Engineering and Environmental Staff, Rural Utilities Service, Utilities Program, 1400 Independence Ave. SW, Mail Stop 1571 Washington D.C. 20250-1571 telephone: (202) 720-1953, fax: (202) 720-0820 or e-mail: dennis.rankin@wdc.usda.gov.

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South Dakota PrairieWinds Project
Environmental Impact Statement (EIS)

Thank you for your interest in the proposed South Dakota PrairieWinds Project (Project). Please complete the appropriate sections of this form to be included on the Project mailing list and/or to provide comments. Written comments can be submitted at the Scoping Meeting, faxed to (720) 962-7263, mailed to the address on the back of this form or sent to the **Project Email Address: sdprairiewinds@wapa.gov.** Comments on the project scope and alternatives should be received by **May 15, 2009**, to be considered in defining the scope for the Draft EIS. For more information about the Project, please go to the **Project Website: http://www.wapa.gov/sdprairiewinds.htm.**

- ☐ I would like to be kept informed of the ongoing progress of this Project. Please include my name on the mailing list.
- ☐ I prefer electronic/email communication.
- ☐ I prefer paper mailings.

Please Print Contact Info Below

Name:	Organization:
E-mail address:	Daytime Phone No. (*optional):*
Street Address:	City / State / Zip Code:

Please indicate any questions, comments or concerns you have about the Project in the comment section below (continue on separate sheet if necessary).

Thank you for your time and interest in the South Dakota PrairieWinds Project.

Please fold in thirds and staple

Affix
postage
here

Ms. Liana Reilly
Western Area Power Administration
Corporate Services Office, A7400
P.O. Box 281213
Lakewood, Colorado 80228-8213

National Environmental Policy Act

The U.S. Department of Energy (DOE) prepared this brochure to encourage and help you to participate in the National Environmental Policy Act (NEPA) process. All Federal agencies must comply with NEPA, but their procedures vary. This brochure describes DOE's NEPA process, focusing on your role in DOE's preparation of Environmental Impact Statements (EISs).

What is NEPA?

NEPA is a Federal law that serves as the Nation's basic charter for environmental protection. It requires that all Federal agencies consider the potential environmental impacts of their proposed actions. NEPA promotes better agency decisionmaking by ensuring that high quality environmental information is available to agency officials and the public before the agency decides whether and how to undertake a major Federal action. Through the NEPA process, you have an opportunity to learn about DOE's proposed actions and to provide timely information and comments to DOE.

To implement NEPA, all Federal agencies follow procedures issued by the President's Council on Environmental Quality in the Code of Federal Regulations (40 CFR Parts 1500-1508). DOE also follows its own supplementary procedures, found in 10 CFR Part 1021.

How Does DOE Prepare an EIS?

The EIS process consists of several steps, each with opportunities for you to be involved.

- **Notice of Intent.** First, DOE publishes a Notice of Intent to prepare an EIS in the *Federal Register* and makes local announcements. This notice states the need for action and provides preliminary information on the EIS scope, including the alternative actions to be evaluated, the kinds of potential environmental impacts to be analyzed, and related issues. The Notice of Intent also serves as the beginning of the next step, the "scoping process."

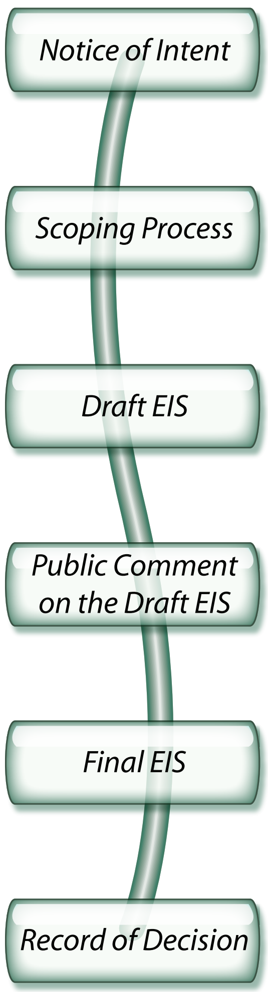
> **TIP:** The Notice of Intent explains how you can participate in the scoping process and provides information about dates and locations of public meetings.

- **Scoping Process.** DOE requests your comments on the scope of the EIS. What alternatives should be evaluated? What potential environmental impacts should be analyzed? DOE's scoping process will last at least 30 days, with at least one public meeting.

> **TIP:** During the scoping process, tell DOE what EIS information you would like to receive (e.g., a summary of the EIS or the full document on CD or on paper).

- **Draft EIS.** DOE considers scoping comments in preparing a Draft EIS. An EIS (Draft or Final) analyzes and compares the potential environmental impacts of the various alternatives, one of which is always a "no action" alternative. The EIS also discusses ways to avoid or reduce adverse impacts. A Draft EIS will identify DOE's preferred alternative(s) if known at the time.

> **TIP:** DOE EIS schedules and related NEPA information are available at *http://www.eh.doe.gov/nepa*. DOE often has EIS-specific Web sites as well.



- **Public Comment on the Draft EIS.** After DOE issues a Draft EIS, the U.S. Environmental Protection Agency (EPA) publishes a Notice of Availability in the *Federal Register* to begin the public comment period, which will last at least 45 days. DOE also will announce details regarding how you may comment on the Draft EIS, either orally at a public hearing (at least one must be held) or in writing.

> **TIP:** Check your local paper, the DOE NEPA Web site (*http://www.eh.doe.gov/nepa*, click on "What's New" or "NEPA Public Participation Calendar"), or other DOE notices for information about public hearings and ways to submit comments.

- **Final EIS.** DOE considers all timely public comments on the Draft EIS in preparing the Final EIS, which must respond to such comments. The Final EIS identifies DOE's preferred alternative(s). After DOE issues the Final EIS, EPA publishes a Notice of Availability in the *Federal Register*.

- **Record of Decision.** DOE must wait at least 30 days after the EPA Notice of Availability of the Final EIS before issuing a Record of Decision. A Record of Decision announces and explains DOE's decision and describes any commitments for mitigating potential environmental impacts.

> **TIP:** DOE publishes Records of Decision in the *Federal Register* and makes them available on the DOE NEPA Web site. You may also ask DOE to send you a copy.

How Does NEPA Work?

Early in its planning process for a proposed action, DOE considers how to comply with the National Environmental Policy Act (NEPA). The appropriate level of review depends on the significance (i.e., the context and intensity) of the potential environmental impacts associated with the proposed action. There are three levels of NEPA review:

- **Environmental Impact Statement (EIS) –** For major Federal actions that may significantly affect the quality of the human environment, NEPA requires preparation of an EIS. An EIS is a detailed analysis of the potential environmental impacts of a proposed action and the range of reasonable alternatives. Public participation is an important part of the EIS process.

- **Environmental Assessment (EA) –** When the need for an EIS is unclear, an agency may prepare an EA to determine whether to prepare an EIS or to issue a Finding of No Significant Impact. An EA is a brief analysis. DOE's procedures provide notification and comment opportunities for host states and tribes. DOE also may provide notification and comment opportunities for other interested people. DOE then considers any comments received, makes revisions as appropriate, and issues the EA.

- **Categorical Exclusion –** DOE's NEPA regulations list classes of actions that normally do not require an EIS or an EA because, individually or cumulatively, they do not have the potential for significant environmental impacts. Examples are information gathering activities and property transfers when the use is unchanged.

How Can I Learn More?

We encourage you to learn more about NEPA, the EIS process, and DOE's current NEPA activities by visiting or contacting the following:

- DOE's NEPA Web site at *http://www.eh.doe.gov/nepa* – to learn about upcoming opportunities to participate in DOE's NEPA process, download DOE NEPA documents, and find requirements and guidance that DOE follows for NEPA implementation.

- DOE's Office of NEPA Policy and Compliance at 1-800-472-2756 (toll-free) – to leave a message regarding EIS-specific or general NEPA information.

- The Council on Environmental Quality's NEPAnet at *http://ceq.eh.doe.gov/nepa/nepanet.htm* – for government-wide NEPA information.

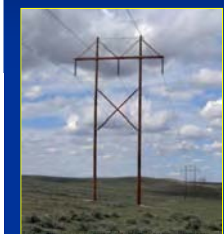
Office of NEPA
Policy and Compliance

Printed on recycled paper

DOE, NEPA, and You

A Guide to Public Participation

South Dakota PrairieWinds
Wind Energy Project



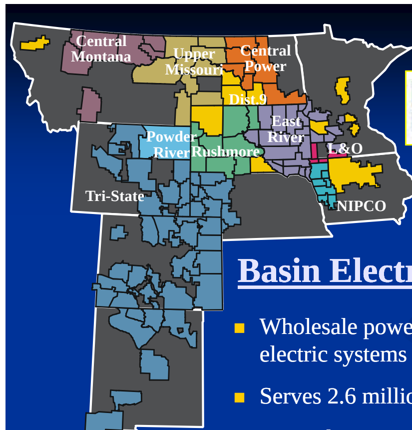
USDA Rural Development | Basin Electric Power Cooperative | PrairieWinds Energy in Motion | Western Area Power Administration

Outline of Presentation

- Basin Electric Information
- Proposed Project Purpose and Need
- Proposed Project Details
- Permitting Process and NEPA Schedule
- Comparison of Wind Speed and Energy Generation
- Example Photos
- Additional Considerations
- Scoping Meeting Format

South Dakota PrairieWinds
Wind Energy Project

Basin Electric Information



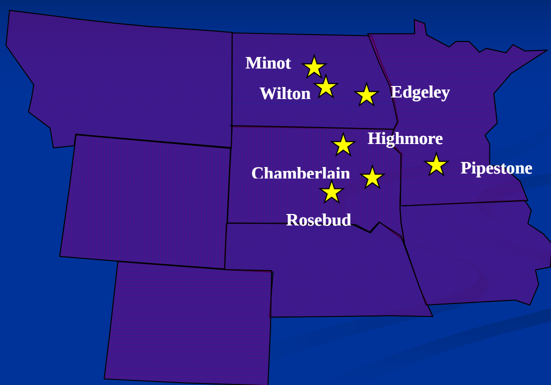
BASIN ELECTRIC POWER COOPERATIVE
Your Touchstone Energy® Cooperative

Basin Electric Information:

- Wholesale power supplier to 126-member rural electric systems
- Serves 2.6 million consumers
- Formed in May, 1961 as supplemental power supplier
- Consumer-owned; consumer-controlled

Basin Electric's Wind Portfolio

Existing Wind Energy Generation – 136 MW



South Dakota PrairieWinds

Wind Energy Project

Proposed Project Purpose and Need

Purpose and Need

- Current incentives/regulations encourage or require power from renewable or low environmental impact resources
- Proposals in Congress for national Renewable Portfolio Standards (RPS)
- Basin Electric needs additional renewable energy capacity to serve forecasted growth demands and meet state-mandated RPS
  - A 150 MW wind project was determined to be the best alternative to satisfy these requirements
  - Applicant – PrairieWinds SD1, Incorporated, a wholly owned subsidiary of Basin Electric

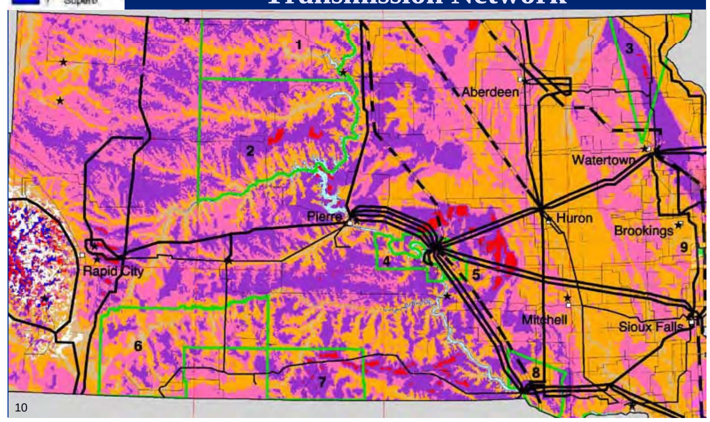
Agencies Involved

- Western's Action Basin Electric has requested to interconnect the proposed Project with Western's transmission system
- RUS's Action PrairieWinds has requested financing for the proposed Project from the RUS
- Both agencies intend to jointly prepare an environmental impact statement (EIS) for the Project

South Dakota PrairieWinds
Wind Energy Project

Proposed Project Details

South Dakota Wind Potential in Proximity to High-Voltage Transmission Network



Proposed Project Alternatives

Project Details

- Will generate approximately 150 MW
- 2 site alternatives - Project components:
  - 101 turbines,
  - Access roads,
  - O&M building,
  - Underground feeder cables and collector substation(s),
  - Approximately 10 to 12 miles of transmission line
- Fall 2010/Winter 2010 – commercial operation

GE 1.5sle Turbine Specifications

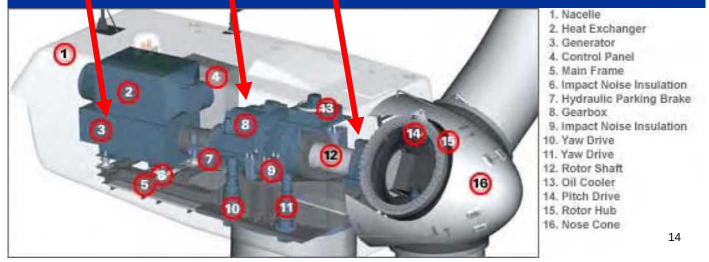
- Variable speed   blades rotate at 12 to 23 RPM
- Start-up wind speed: approximately 7 to 8 MPH
- Shut-down wind speed: approximately 56 MPH
- Optimum wind speed: 26 to 55 MPH
- Operational temperature range: - 20° to 104° F
- Variable pitch blades
- High tech electronic controls
- 3 fiberglass blades (14,000 lbs per blade)
- Hub height: 262 feet
- Blade length:135 feet

3 Major Components of Turbines

Generator

Gearbox

Rotor/Blades/Main Shaft



South Dakota PrairieWinds
Wind Energy Project

Permitting Process and NEPA Schedule

Permitting Process –
Scoping and environmental analysis

- NEPA
  - Scoping to gain agency, organization, and public input
  - Environmental Impact Statement
  - Agency involvement:
    financing – RUS
    interconnection   Western
- South Dakota Public Utilities Commission – siting approval
- Local zoning
- Other pre-construction permits and authorizations

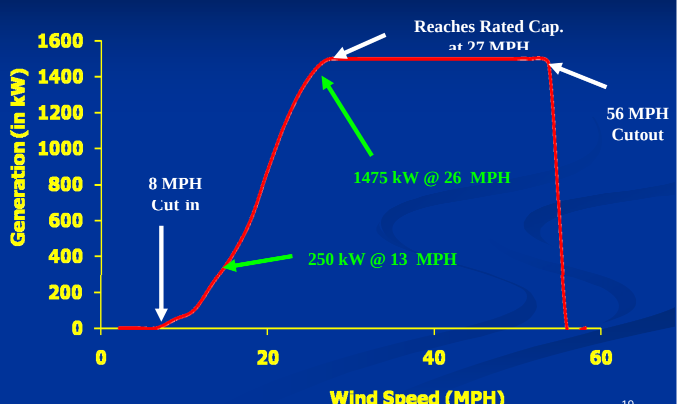
South Dakota PrairieWinds

Wind Energy Project

Comparison of Wind Speed and Energy Generation

Power Curve:

A 1 MPH change in annual average speed can change production by 15%



South Dakota PrairieWinds

Wind Energy Project

Example Photos:

•Turbine Construction
• Collector Substation
• Transmission Structures
• Facility Layout

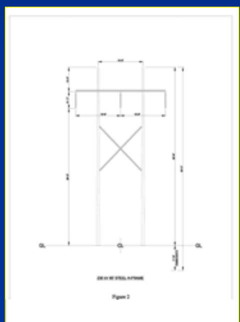

Initial Construction Step:
Complete Foundation
21


Construction of Turbines
Tower Section Delivery
Setting the Base
Nacelle (includes Generating Components) and Turbine Module
Blade Installation


Completed Turbines
23


Collector Substation
(Example Only)
24

Typical Transmission Structure



Facility Layout

(Example Only)

South Dakota PrairieWinds
Wind Energy Project

Additional Considerations:

• Potential Local Benefits
• Schedule and Cost

Potential Local Benefits

- Project construction
  - Increase demand for local lodging, meals and construction materials
  - 225 - 250 temporary jobs
- Project operation
  - 10-12 permanent jobs
- Increase tax base
- Increase renewable energy capacity, and system reliability

Proposed Schedule/Cost

- Obtain permits/approvals ongoing
- Summer 2010 begin construction
- Fall 2010/Winter 2010 commercial operation
- Project cost estimate = $350 million

South Dakota PrairieWinds
Wind Energy Project

Scoping Meeting Format

Open House Scoping Meeting

- Please sign in at the registration table
- Feel free to visit the various stations around the room
- Ask questions
- Provide input
- Your comments are important to this process

Thank You

Welcome to:

South Dakota PrairieWinds Project

Scoping Meeting

Outline of Presentation

- Basin Electric Information
- Proposed Project Purpose and Need
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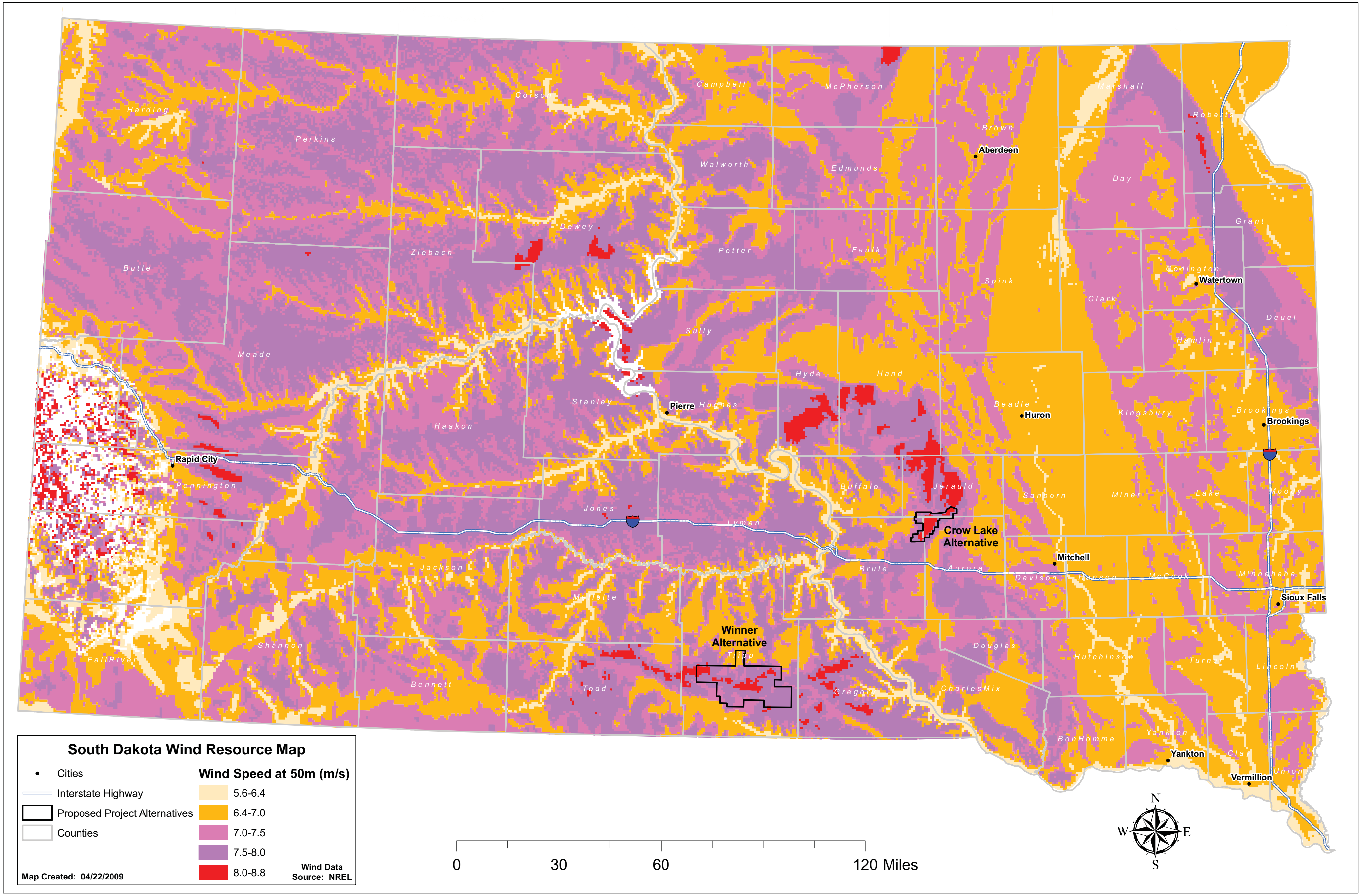
Basin Electric's Project Objectives

Renewable Energy Goals

- **Meet current incentives/regulations that encourage or require power from renewable or low environmental impact resources**
- **Conform with proposals in Congress for national Renewable Portfolio Standards (RPS)**
- **Basin Electric needs additional renewable energy capacity to serve forecasted growth demands and meet state-mandated RPS**
  - **A 150 MW wind project was determined to be the best alternative to satisfy these requirements**
  - **Applicant – PrairieWinds SD1, Incorporated, a wholly owned subsidiary of Basin Electric**



South Dakota Wind Resource Map
Cities
Interstate Highway
Proposed Project Alternatives
Counties
Wind Speed at 50m (m/s)
5.6-6.4
6.4-7.0
7.0-7.5
7.5-8.0
8.0-8.8
Map Created: 04/22/2009
Wind Data Source: NREL
0
30
60
120 Miles
N
S
E
W
Crow Lake Alternative
Winner Alternative
Rapid City
Pierre
Aberdeen
Watertown
Huron
Brookings
Mitchell
Sioux Falls
Yankton
Vermillion
Harding
Perkins
Corson
Campbell
McPherson
Brown
Marshall
Roberts
Walworth
Edmunds
Day
Grant
Butte
Ziebach
Dewey
Potter
Faulk
Spink
Codington
Clark
Deuel
Hamlin
Meade
Sully
Hyde
Hand
Beadle
Kingsbury
Brookings
Stanley
Hughes
Haakon
Pennington
Jones
Lyman
Buffalo
Jerauld
Sanborn
Miner
Lake
Moody
Jackson
Brule
Aurora
Davison
Hanson
McCook
Minnehaha
Mellette
Shannon
Tripp
Douglas
Hutchinson
Turner
Lincoln
Fall River
Bennett
Todd
Gregory
Charles Mix
Bon Homme
Yankton
Clay
Union

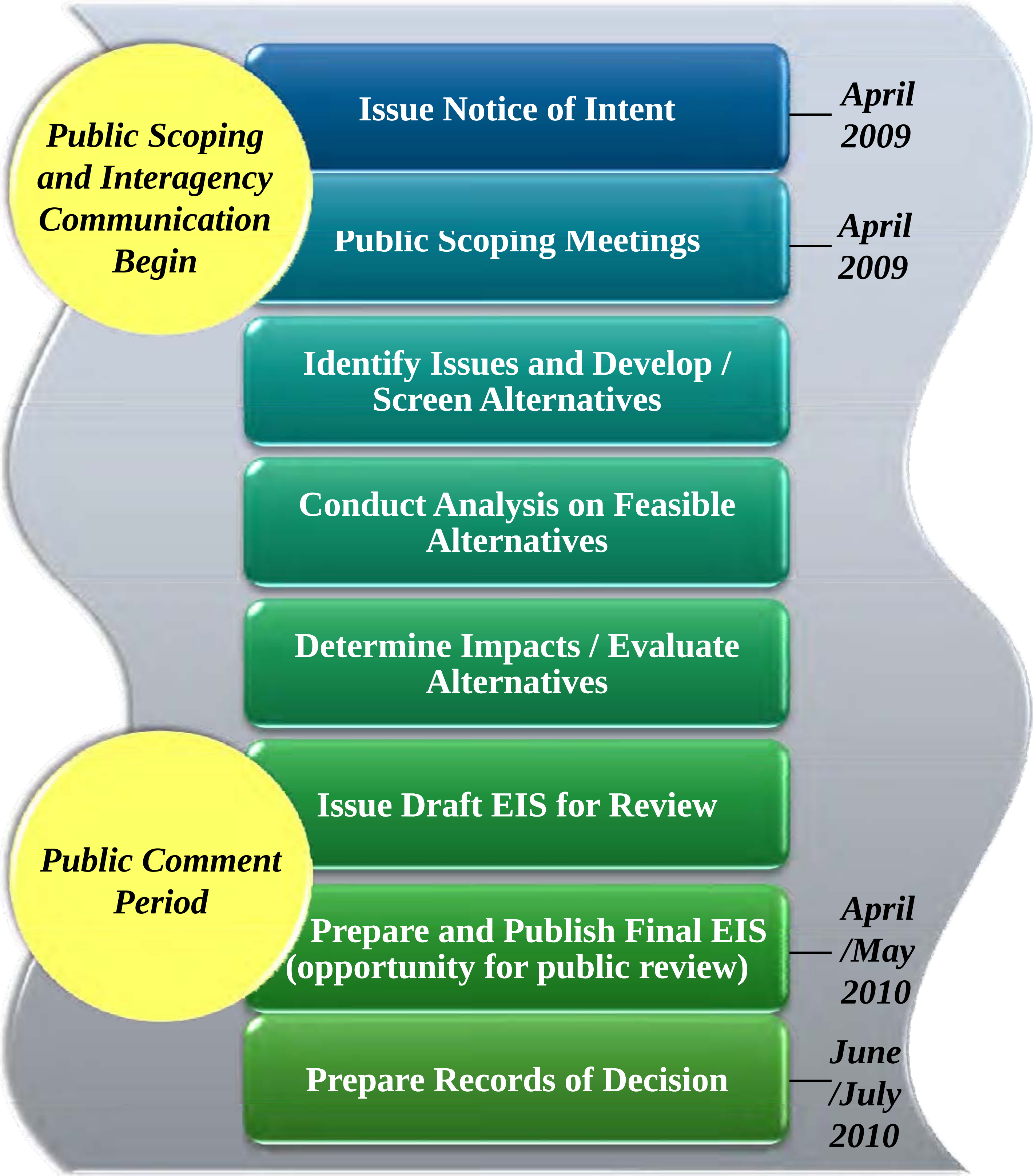
- ❑ Wind potential and topography
- ❑ Ability to lease contiguous parcels of land
- ❑ Minimum distance of 400 feet from section lines or existing roads
- ❑ Minimum distance of 1000 feet from occupied residences
- ❑ Minimum distance of 400 feet from existing transmission line
- ❑ Avoidance of hydric soils areas
- ❑ Siting on USFWS grasslands easements was near edges to minimize impact
- ❑ 1000 to 2000-foot minimum between turbine locations within the predominant wind direction
- ❑ Avoid siting within existing micro-wave paths

- ❑ Minimization of transmission line length
- ❑ Consider right-of-way requirements and availability of contiguous parcels of land
- ❑ Land use considerations (i.e., potential visual impacts, proximity to residences, potential impact to agricultural activities, and existing/future land use)
- ❑ Environmental resource considerations such as potential impacts to sensitive resources (i.e., cultural resources, wildlife, vegetation, and wetlands
- ❑ Jurisdiction and regulatory considerations
- ❑ Consider airport height restrictions

- ❑ Geology, Soils, Paleontology, and Seismicity
- ❑ Water Resources
- ❑ Climate Change and Air Quality
- ❑ Biological Resources
- ❑ Wetlands/Riparian Areas
- ❑ Cultural Resources
- ❑ Land Use
- ❑ Transportation
- ❑ Recreation
- ❑ Visual Resources
- ❑ Noise
- ❑ Socioeconomics
- ❑ Environmental Justice
- ❑ Health and Safety

USDA Rural Development · Basin Electric Power Cooperative · PrairieWinds Energy in Motion · Western Area Power Administration

ENVIRONMENTAL IMPACT STATEMENT PROCESS



BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Western's Role and Need for Agency Action

Who is Western?

- Agency within the USDOE
- Owns, operates and maintains transmission lines including lines near the proposed PrairieWinds project
- Markets federal hydroelectric power including power from power plants on the Missouri River

Why is Western involved?

- Evaluate interconnection request per its generator interconnection procedures
- Evaluate involvement
- Co-lead for NEPA process

RUS's Role and Need for Agency Action

Who is RUS?

- Formerly the Rural Electrification Administration
- Agency within the USDA
- Delivers USDA's Rural Development Utilities Programs
- Makes loans/loan guarantees for electric distribution, transmission and generation facilities, telecommunication facilities and water and waste water facilities

Why is RUS involved?

- Evaluate financing request
- Evaluate engineering and technical aspects of the project
- Co-lead for NEPA process

April 09, 2009

Gail Arnott
President
Wessington Springs Area Development Corporation
P.O Box 132
Wessington Springs, SD 57382

Dear Gail Arnott:

The purpose of this letter is to inform you of a proposed project and to provide notice that Western and RUS intend to prepare an Environmental Impact Statement (EIS) addressing their respective Federal actions. This letter also serves as an invitation for your agency to participate in our interagency meeting on April 28th and to attend scoping meetings for the project.

PrairieWinds SD1, Incorporated (PrairieWinds), a subsidiary of Basin Electric Power Cooperative (Basin Electric), has proposed to develop a wind-powered generating facility in south-central South Dakota, either near Wessington Springs or near Winner. Basin Electric has requested to interconnect the proposed project with Western Area Power Administration's (Western) transmission system. PrairieWinds has requested financing for the proposed project from the Rural Utilities Service (RUS), an agency within the U.S. Department of Agriculture (USDA).

Basin Electric's generator interconnection request and PrairieWinds's financing request triggers a National Environmental Policy Act (NEPA) review process of the proposed project by Western and RUS, respectively. Western and RUS are serving as co-lead Federal agencies for preparation of the EIS. Western will serve as the lead Federal agency for consultations with the U.S. Fish and Wildlife Service under section 7 of the Endangered Species Act and for consultations with the South Dakota State Historic Preservation Office under section 106 of the National Historic Preservation Act.

Western and RUS invite you to attend an interagency meeting occurring on April 28, 2009, to provide you input on the proposed project's scoping process. During the meeting we would like

to discuss the project component details, obtain input to understand any issues that your Agency believes are important in the EIS analysis, and review the project schedule. The interagency meeting details are as follows:

Best Western Ramkota Hotel
920 W Sioux Ave
Pierre, South Dakota 57501-1800
Tuesday, April 28, 2009
9 a.m. to 11 a.m.

Western and RUS are conducting scoping, including open-house public scoping meetings, to ensure that interested members of the public, potentially affected landowners and lessees, and Federal, state, local, and tribal agencies have an opportunity to provide input on the scope of the EIS and the alternatives that will be addressed in the EIS. Western, RUS, and PrairieWinds representatives will be available at the scoping meetings for one-on-one discussions, to provide information about the proposed project, answer questions, and take verbal and written comments from interested parties. Information for each alternative wind generating site will be available at two public scoping meetings as follows:

Holiday Inn Express and Suites
1360 East Highway 44
Winner, South Dakota 57580
Tuesday, April 28, 2009
4 p.m. to 7 p.m.

Commerce Street Grille
118 North Main Street
Plankinton, South Dakota 57368
Wednesday, April 29, 2009
4 p.m. to 7 p.m.

The proposed PrairieWinds project would involve the installation and operation of a 150-megawatt (MW) wind energy facility that would feature 101 wind turbine generators. Each turbine generator would have a hub height of 262 feet and a turbine rotor diameter of 252 feet. The total height of each wind turbine would be 389 feet with a blade in the vertical position. The towers would be constructed of tubular steel, approximately 15 feet in diameter at the base, with internal joint flanges. The color of the towers and rotors would be standard white or off-white. During construction, a work/staging area at each turbine would include the crane pad and rotor assembly area, temporarily disturbing an area about 190 feet by 210 feet.

Each wind turbine would be connected by a service road for access and a 34.5-kilovolt (kV) buried electrical collection system that would ultimately route the power from each turbine to a central collector substation, where voltage would be stepped up for interconnection to Western's transmission system. About 30 to 40 miles of new access roads would be built to facilitate both

construction and maintenance of the turbines. Approximately 25 to 35 miles of existing roads would be used and, where appropriate, improved.

Two sites for the wind-powered generation facility are under consideration (see enclosed map). One site is located on about 37,000 acres and is approximately 15 miles north of White Lake, South Dakota, within Brule, Aurora, and Jerauld counties. The other alternative site would be located within an area about 83,000 acres, and is about 8 miles south of Winner, South Dakota, and is entirely within Tripp County.

The site that is approximately 37,000 acres near White Lake, South Dakota, would require a new 230-kV transmission line to deliver the power from the collector substation(s) to a new 230-kV Western interconnection point at Western's Wessington Springs Substation, located in Jerauld County. The Wessington Springs Substation is located approximately 9 to 12 miles from the proposed collector substation(s). The proposed line would be built using wood or steel H-frame (two pole) structures or steel single-pole structures. The structures would be about 85 to 95 feet high and span about 800 feet.

The other alternative site, approximately 83,000 acres near Winner, South Dakota, would require a 34.5-kV to 115-kV collector substation(s) as well as a 115-kV transmission line to interconnect to Western's existing 115-kV Winner Substation. Other facilities necessary for this site would be similar to those described for the site above.

The no action alternative will also be considered.

There is a chance that the final interconnection studies will conclude that other transmission facilities, such as network upgrades remote from the project site, would be required. If the project moves forward and it is determined that other facilities are needed to support the interconnection request, Western and RUS will complete the appropriate level of environmental review.

We want to ensure that any important environmental concerns and natural resources and/or places of interest for your Agency within the project area are considered and addressed in the EIS. At this time, we would appreciate receiving any information that you would be willing to share with us on any unique or special resources or areas in or near the proposed project. If you are aware of any other individuals or affiliated organizations that should be consulted regarding this project, please let us know. A full list of all other agencies and individuals receiving this letter is enclosed.

If any additional agency representatives wish to be added to the project's mailing list and/or receive a copy of the Draft and Final EIS, please contact Ms. Liana Reilly or Mr. Dennis Rankin

at the phone numbers or addresses listed below. Comments on the project scope and alternatives should be received by May 15, 2009, to be considered in defining the scope for the Draft EIS. Comments on the proposed project will be accepted and considered throughout the NEPA process.

During this scoping phase, we would like to obtain input to understand any issues that your Agency believes are important. Western and RUS request that you comment on the proposal, offer suggestions to improve the proposal and suggest alternative actions. Please identify any issues of concern about potential environmental impacts. Please address comments, questions or concerns to Ms. Liana Reilly or Mr. Dennis Rankin at the addresses below.

Ms. Liana Reilly
Document Manager
Western Area Power Administration
Corporate Services Office - A7400,
P.O. Box 281213
Lakewood, Colorado 80228-8213
Phone: (720) 962-7253 or (1-800) 336-7288
Fax: (720) 962-7263
E-mail: sdprairiewinds@wapa.gov

Mr. Dennis Rankin
Project Manager
Engineering and Environmental Staff
Rural Utilities Service, Utilities Program
1400 Independence Ave. SW, Mail Stop 1571
Washington D.C. 20250-1571,
Phone: (202) 720-1953
Fax: (202) 720-0820
E-mail: dennis.rankin@wdc.usda.gov

We look forward to hearing from you.

Sincerely,

Nicholas J Stas

Nick Stas

Environmental Manager
Upper Great Plains Region
Western Area Power Administration

Enclosures

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April 09, 2009

Natalie Gates
US Fish and Wildlife Service
Federal Wildlife Regulations
420 South Garfield Ave, Suite 400
Pierre, SD 57501

Dear Natalie Gates:

The purpose of this letter is to inform you of a proposed project and to provide notice that Western and RUS intend to prepare an Enivornmental Impact Statement (EIS) addressing their respective Federal actions. This letter also serves as an invitation for an interagency meeting as well as provides information to you about our scoping process.

PrairieWinds SD1, Incorporated (PrairieWinds), a subsidiary of Basin Electric Power Cooperative (Basin Electric), has proposed to develop a wind-powered generating facility in south-central South Dakota, either near Wessington Springs or near Winner. Basin Electric has requested to interconnect the proposed project with Western Area Power Administration's (Western) transmission system. PrairieWinds has requested financing for the proposed project from the Rural Utilities Service (RUS), an agency within the U.S. Department of Agriculture (USDA).

Basin Electric's generator interconnection request and PrairieWinds's financing request triggers a National Environmental Policy Act (NEPA) review process of the proposed project by Western and RUS, respectively. Western and RUS are serving as co-lead Federal agencies for preparation of the EIS. Western will serve as the lead Federal agency for consultations with the U.S. Fish and Wildlife Service under section 7 of the Endangered Species Act and for consultations with the South Dakota State Historic Preservation Office under section 106 of the National Historic Preservation Act.

Western and RUS invite you to attend an interagency meeting occurring on April 28, 2009 to provide you input on the proposed project's scoping process. During the meeting we would like

to discuss the project component details, obtain input to understand any issues that your Agency believes are important in the EIS analysis, and review the project schedule. The interagency meeting details are as follows:

Best Western Ramkota Hotel
920 W Sioux Ave
Pierre, South Dakota 57501-1800
Tuesday, April 28, 2009
9 a.m. to 11 a.m.

In addition, this letter serves to invite your agency to become a cooperating agency in the EIS process for the proposed project. The Council on Environmental Quality NEPA Implementing Regulations (40 CFR part 1501.6) emphasizes agency cooperation and authorizes the designated lead Federal agency to request that other Federal agencies with jurisdiction by law be a cooperating agency. Additionally, the lead Federal agency may request that any other Federal agency with special expertise with respect to any environmental issue to be addressed in the EIS also be a cooperating agency. Designated cooperating agencies have certain responsibilities to support the NEPA process, as specified in 40 CFR 1501.6 (b). The benefits of becoming a cooperating agency include disclosure of relevant information early in the EIS process and establishment of a mechanism to address any intergovernmental issues. Should your agency decide not to become a formal cooperating agency for the EIS, you will continue to be kept informed of project developments through the project mailing list, and you will receive the draft and final EIS documents. Any concerns or comments your agency provides to us during the NEPA process, and in a timely fashion, will be fully considered in finalizing the EIS and our Records of Decision (RODs).

The proposed PrairieWinds project would involve the installation and operation of a 150-megawatt (MW) wind energy facility that would feature 101 wind turbine generators. Each turbine generator would have a hub height of 262 feet and a turbine rotor diameter of 252 feet. The total height of each wind turbine would be 389 feet with a blade in the vertical position. The towers would be constructed of tubular steel, approximately 15 feet in diameter at the base, with internal joint flanges. The color of the towers and rotors would be standard white or off-white. During construction, a work/staging area at each turbine would include the crane pad and rotor assembly area, temporarily disturbing an area about 190 feet by 210 feet.

Each wind turbine would be connected by a service road for access and a 34.5-kilovolt (kV) buried electrical collection system that would ultimately route the power from each turbine to a central collector substation, where voltage would be stepped up for interconnection to Western's transmission system. About 30 to 40 miles of new access roads would be built to facilitate both

construction and maintenance of the turbines. Approximately 25 to 35 miles of existing roads would be used and, where appropriate, improved.

Two sites for the wind-powered generation facility are under consideration (see enclosed map). One site is located on about 37,000 acres and is approximately 15 miles north of White Lake, South Dakota, within Brule, Aurora, and Jerauld counties. The other alternative site would be located within an area about 83,000 acres, and is about 8 miles south of Winner, South Dakota, and is entirely within Tripp County.

The site that is approximately 37,000 acres near White Lake, South Dakota, would require a new 230-kV transmission line to deliver the power from the collector substation(s) to a new 230-kV Western interconnection point at Western's Wessington Springs Substation, located in Jerauld County. The Wessington Springs Substation is located approximately 9 to 12 miles from the proposed collector substation(s). The proposed line would be built using wood or steel H-frame (two pole) structures or steel single-pole structures. The structures would be about 85 to 95 feet high and span about 800 feet.

The other alternative site, approximately 83,000 acres near Winner, South Dakota, would require a 34.5-kV to 115-kV collector substation(s) as well as a 115-kV transmission line to interconnect to Western's existing 115-kV Winner Substation. Other facilities necessary for this site would be similar to those described for the site above.

The no action alternative will also be considered.

There is a chance that the final interconnection studies will conclude that other transmission facilities, such as network upgrades remote from the project site, would be required. If the project moves forward and it is determined that other facilities are needed to support the interconnection request, Western and RUS will complete the appropriate level of environmental review.

We want to ensure that any important environmental concerns and natural resources and/or places of interest for your Agency within the project area are considered and addressed in the EIS. At this time, we would appreciate receiving any information that you would be willing to share with us on any unique or special resources or areas in or near the proposed project. If you are aware of any other individuals or affiliated organizations that should be consulted regarding this project, please let us know. A full list of all other agencies and individuals receiving this letter is enclosed.

If any additional agency representatives wish to be added to the project's mailing list and/or receive a copy of the Draft and Final EIS, please contact Ms. Liana Reilly or Mr. Dennis Rankin

at the phone numbers or addresses listed below. Comments on the project scope and alternatives should be received by May 15, 2009, to be considered in defining the scope for the Draft EIS. Comments on the proposed project will be accepted and considered throughout the NEPA process.

At this time, Western and RUS are conducting scoping, including public scoping meetings, to ensure that interested members of the public, potentially affected landowners and lessees, and Federal, state, local, and tribal agencies have an opportunity to provide input on the scope of the EIS and the alternatives that will be addressed in the EIS. Western, RUS, and PrairieWinds representatives will be available at the scoping meetings for one-on-one discussions, to provide information about the proposed project, answer questions, and will take verbal and written comments from interested parties. Information will be available at two public scoping meetings as follows:

Holiday Inn Express and Suites
1360 East Highway 44
Winner, South Dakota 57580
Tuesday, April 28, 2009
4 p.m. to 7 p.m.

Commerce Street Grille
118 North Main Street
Plankinton, South Dakota 57368
Wednesday, April 29, 2009
4 p.m. to 7 p.m.

During this scoping phase, we would like to obtain input to understand any issues that your Agency believes are important. Western and RUS request that you comment on the proposal, offer suggestions to improve the proposal and suggest alternative actions. Please identify any issues of concern about potential environmental impacts. Please address comments, questions or concerns to Ms. Liana Reilly or Mr. Dennis Rankin at the addresses below.

Ms. Liana Reilly
Document Manager
Western Area Power Administration
Corporate Services Office - A7400,
P.O. Box 281213
Lakewood, Colorado 80228-8213
Phone: (720) 962-7253 or (1-800) 336-7288
Fax: (720) 962-7263
E-mail: reilly@wapa.gov

Mr. Dennis Rankin
Project Manager
Engineering and Environmental Staff
Rural Utilities Service, Utilities Program

1400 Independence Ave. SW, Mail Stop 1571
Washington D.C. 20250-1571,
Phone: (202) 720-1953
Fax: (202) 720-0820
E-mail: dennis.rankin@wdc.usda.gov

We look forward to hearing from you.

Sincerely,

Nicholas J Stas

Nick Stas
Environmental Manager
Upper Great Plains Region
Western Area Power Administration

Enclosures

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Agencies and Individuals who Received the Invitations

** Those with an asterisk were invited to be a cooperator*

* Aurora County Weed Supervisor
* Brule County Weed Supervisor & Highway
* Bureau of Indian Affairs
* Commission Chairperson for Chamberlain, South Dakota
* Commission Chairperson for Plankinton, South Dakota
* Commission Chairperson for Wessington Springs, South Dakota
* Commission Chairperson for Winner, South Dakota
DOE - South Dakota State NEPA Contact
Ducks Unlimited
Environmental Protection Agency, Region 8
* Farm Service Agency
Federal Emergency Management Agency
* Federal Highway Administration
* Highway Superintendent for Wessington Springs, South Dakota
* Jerauld County Weed Supervisor
Mayor of Wessington Springs, South Dakota
Mayor of Winner, South Dakota
Natural Resource Conservation Service
Nature Conservancy
Plankinton City Hall
Sierra Club
South Dakota Aeronautics Commission
South Dakota Department of Health
* South Dakota Department of Transportation
South Dakota Dept of Agriculture
South Dakota Dept of Environment and Natural Resources
South Dakota Forest Service
* South Dakota Game, Fish, and Parks
South Dakota Governor's Office
South Dakota Highway Patrol
South Dakota Indian Affairs Commission
* South Dakota Public Utilities Commission
South Dakota Senator
South Dakota State Historic Preservation Office
South Dakota State Historical Society
South Dakota State Land Department
South Dakota State Representative
South Dakota Transmission Authority
* Tripp County Weed Supervisor
* US Army Corps of Engineers
* US Fish and Wildlife Service
USGS Northern Prairie Wildlife Research Center
USGS South Dakota State University
Wessington Springs Area Development Corporation

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YOU ARE INVITED!
TO A PUBLIC MEETING

The USDA Rural Utilities Service (RUS) and Western Area Power Administration (Western) are hosting two open-house public meetings to discuss a new 150-megawatt wind energy project.

PrairieWinds SD1, Inc., (PrairieWinds), a subsidiary of Basin Electric Power Cooperative, proposes to construct 101 wind turbines in one of two alternate locations. One location would be south of Wessington Springs, approximately **10 miles north of the town of White Lake**, in Aurora, Jerauld and Brule counties in South Dakota. The other location would be approximately **15 miles south of the town of Winner**, in Tripp County, South Dakota.

Representatives from RUS, Western and PrairieWinds will be available to answer your questions, offer more information about the proposed project and take your comments. Your comments will help define the scope of the Environmental Impact Statement.

PLEASE JOIN US

April 28, 2009, 4:00 p.m. to 7:00 p.m.
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Winner, SD 57580

April 29, 2009, 4:00 p.m. to 7:00 p.m.
Commerce Street Grille
118 S Main Street
Plankinton, SD 57368

NEED MORE INFORMATION?

Liana Reilly
Western Area Power Administration
Corporate Services Office
A7400 P.O. Box 281213
Lakewood, Colorado 80228-8213
email: sdprairiewinds@wapa.gov
Phone: 1-800-336-7288

Western
AREA POWER
ADMINISTRATION

USDA
Rural
Development

Or visit the Project Web site at:
www.wapa.gov/transmission/sdprairiewinds.htm

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Western AREA POWER ADMINISTRATION

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Earth Day messages

and installing energy-efficient appliances and light bulbs in their homes.

In addition, beef producers ap-

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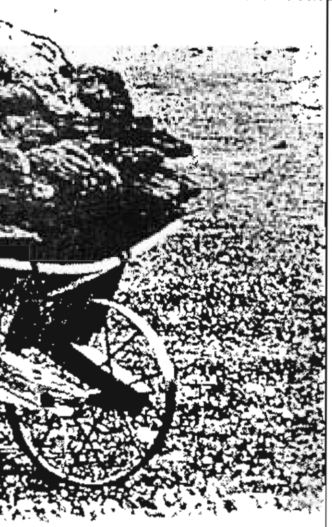
n...

TRIPP COUNTY Historical Society

Preserving our past... For our future!

ssible. If you have a picture or early an be returned to you. It is difficult Please help us preserve history.



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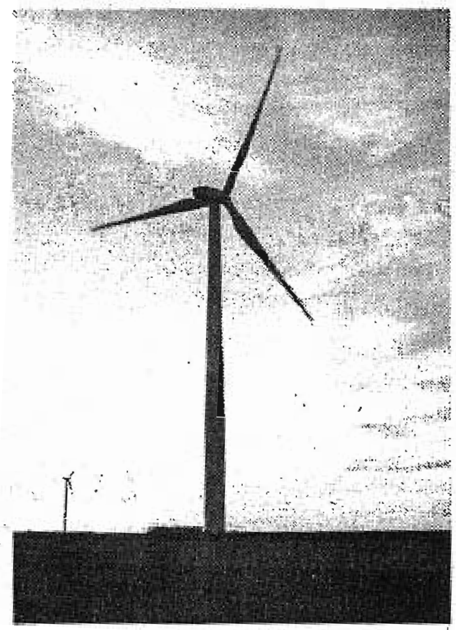
160164-042209

YOU ARE INVITED!

TO A PUBLIC MEETING



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Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

SEE ATTACHED LIST

Dear Honorable Chairperson, Mr. Lester Thompson:

Western Area Power Administration (Western), a power-marketing agency of the U.S. Department of Energy, has received a request to interconnect its transmission system near Wessington Springs, South Dakota with a wind generating facility that has been proposed by PrairieWinds, SD1, Incorporated (PrairieWinds), a subsidiary of Basin Electric. PrairieWinds has applied for financial assistance for the proposed project from the Rural Utility Service (RUS), an agency which administers the U.S. Department of Agriculture's Rural Development Utilities Programs. Western and RUS are considering these respective requests thereby making the project an undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR Part 800). In accordance with 36 CFR § 800.2(a)(2), Western will serve as the lead agency for the purposes of Section 106 review.

The purpose of this letter is to inform you of the proposed project and to provide notice that Western and RUS intend to prepare an Environmental Impact Statement (EIS) addressing their respective Federal actions. This letter also serves to initiate Government-to-Government consultation. With this letter, Western and RUS invite your participation in the reviews conducted under the National Environmental Policy Act (NEPA) and Section 106 of NHPA..

The proposed PrairieWinds project would involve the installation and operation of a 150 megawatt (MW) wind energy facility that would feature 101 wind turbines (WTG). Each turbine generator would have a hub height of 262 feet and a turbine rotor diameter of 252 feet. The total height of each wind turbine would be 389 feet with a blade in the vertical position. The towers would be constructed of tubular steel, approximately 15 feet in diameter at the base, with internal joint flanges. The color of the towers and rotors would be standard white or off-white. During construction, a work/staging area at each turbine would include the crane pad and rotor assembly area, temporarily disturbing an area about 190 feet by 210 feet.

Each wind turbine would be connected by a service road for access and a 34.5 kilovolt (kV) electrical collection system that would ultimately route the power from each turbine to a central collector substation, where voltage would be stepped up for interconnection to Western's transmission system. About 30 to 40 miles of new access roads would be built to facilitate both construction and maintenance of the turbines. Approximately 25 to 35 miles of existing roads would be used and, where appropriate, improved.

Two sites for the wind generation facility are under consideration (see enclosed map). One site is located on about 37,000 acres about 15 miles north of White Lake, South Dakota, within Brule, Aurora, and Jerauld counties, South Dakota. Under this alternative, a new 230-kV transmission line would be required to deliver the power from the collector substation(s) to a new 230-kV Western interconnection point at Western's Wessington Springs Substation, located in Jerauld County. The Wessington Springs Substation is located approximately 9 to 12 miles from the proposed collector substation(s). The proposed line would be built using wood or steel H-frame (two pole) structures or steel single-pole structures. The structures would be about 85 to 95 feet high and span about 800 feet.

The other alternative site, near Winner entirely in Tripp County, South Dakota, would be located within an area about 83,000 acres and require 34.5-kV to 115-kV collector substation(s) as well as a 115-kV transmission line to interconnect to Western's existing 115-kV Winner Substation. Other facilities would be similar to those described for the first alternative site above.

There is a chance that the final interconnection studies will conclude that other transmission facilities, such as network upgrades remote from the project site, would be required. If it is determined that other facilities are needed to support the interconnection request, Western will complete the appropriate level of environmental review.

Western and RUS are serving as co-lead Federal agencies under NEPA for preparation of the EIS. With this notice, you are invited to be cooperating agency. Designated cooperating agencies have certain responsibilities to support the NEPA process, as specified at 40 CFR 1501.6 (b).

Cultural resources are among the important environmental resources that will be addressed during the planning and the preparation of the EIS for the proposed project. We want to ensure that any important cultural and natural resources and/or places with traditional cultural significance for your Tribe within the project area are considered and addressed in the NEPA and Section 106 reviews. At this time, we would appreciate receiving any information that you would be willing to share with us on any unique, special, ethnographic, or archaeological resources or areas in or near the proposed Project. If you are aware of any other Tribes, individuals, or tribally affiliated organizations that should be consulted regarding this project, please let us know. A list of the other Tribes receiving this invitation to government-to-government consultation is enclosed.

Western and RUS are conducting scoping, including public scoping meetings, to ensure that interested members of the public, potentially affected landowners and lessees, and Federal, state, local, and tribal agencies have an opportunity to provide input on the scope of the EIS and the alternatives that will be addressed in the EIS. Western, RUS, and Project representatives at the scoping meetings will provide information about the proposed project, answer questions, and will take comments from interested parties. Western and RUS request that you comment on the proposal, offer suggestions to improve the proposal and suggest alternative actions. Please identify any issues of concern about potential environmental impacts. Written comments may be left with one of the Western or RUS representatives at the scoping meeting, or may be provided by fax, e-mail or the U.S. Postal Service to Ms. Liana Reilly or Steve Tromly, or by mailing the enclosed addressed response sheet.

Western will coordinate its compliance with Section 106 and its implementing regulations (36 CFR Part 800) with the steps taken to meet the requirements of NEPA. As part of this effort, Western will use its NEPA procedures for public involvement to meet its responsibility to seek and consider the views of the public in Section 106 review, pursuant to 36 CFR § 800.2(d).

The open-house public scoping meetings will be held at the Holiday Inn Express and Suites, 1360 East Highway 44, in Winner South Dakota, on April 28, 2009, and the Commerce Street Grille, 1218 North Main Street, in Plankinton, South Dakoka on April 29, 2009. You may attend a meeting of your choosing at any time between 4 and 7 p.m. You will have the opportunity to view the proposed project and NEPA process displays and other information.

If you wish to be added to the project's mailing list and/or receive a copy of the Draft EIS, please return the response sheet or contact Ms. Liana Reilly at the phone number or address listed below. Comments on the project scope and alternatives should be received by May 15, 2009, to be considered in defining the scope for the EIS. Comments on the proposed project will be accepted and considered throughout the NEPA process.

We would like to obtain input to understand any issues that you or your Tribe believes are important. We will also follow up with a telephone call to discuss issues and, if requested, arrange a site visit. Please address comments, questions or concerns to Ms. Liana Reilly or Mr. Steve Tromly, at the addresses below.

Ms. Liana Reilly
NEPA Document Manager
Western Area Power Administration
Natural Resource Office
12155 West Alameda Parkway
Lakewood, CO 80228-8213
Phone: (720) 962-7253
Fax: (720) 962-7263
E-mail: reilly@wapa.gov

Mr. Steve Tromly
Native American Liaison
Western Area Power Administration
Natural Resource Office
12155 West Alameda Parkway
Lakewood, CO 80228-8213
Phone: (720) 962-7256
Fax: (720) 962-7263
E-mail: tromly@wapa.gov

We look forward to hearing from you.

Sincerely,

Nicholas J Stas

Nick Stas
Environmental Manager

Enclosures

cc:

Mr. Dennis Rankin
Project Manager
Engineering and Environmental Staff
Rural Utilities Service, Utilities Program
1400 Independence Ave. SW, Mail Stop 1571
Washington D.C. 20250-1571

N. Stas, B0400
R. O'Sullivan, B0400
D. Kluth, B0400
L. Reilly, A7400, Lakewood, CO
S. Tromly, A7400, Lakewood, CO
D. Swanson, A7400, Lakewood, CO

South Dakota PrairieWinds Project Nation-to-Nation Consultation List
(list of recipients in random order)

Mr. Kevin Jensvold, Chairperson
Upper Sioux Indian Community

CC
Mr. Scott Larson
Upper Sioux Indian Community

Ms. Jean Stacy, President
Lower Sioux Indian Community

CC
Ms. Pamela Halverson, THPO
Lower Sioux Indian Community

Ms. Myra Pearson, Chairwoman
Spirit Lake Tribal Council

Mr. Mike Salvage, Chairman
Sisseton-Wahpeton Dakota Nation

CC
Ms. Dianne Derosiers, THPO
Sisseton-Wahpeton Oyate

Mr. Joshua Weston, President
Flandreau Santee Sioux Executive Committee

Mr. Robert Cournower, Chairperson
Yankton Sioux Tribal Business and
Claims Committee

CC
Faith Spotted Eagle
Cultural Resources

Mr. Roger Trudell, Chairman
Santee Sioux Tribe of Nebraska

CC
Mr. Robert Campbell, Councilman
Santee Sioux Tribe of Nebraska

Mr. Rodney Bordeaux, President
Rosebud Sioux Tribe

CC
Mr. Russell Eagle Bear, THPO
Rosebud Sioux Tribe of Indians

Mr. Lester Thompson, Jr., Chairman
Crow Creek Sioux Tribe

Mr. Harold Frazier, Chairman
Cheyenne River Sioux Tribe

CC
Mr. Albert LeBeau, THPO
Cheyenne River Sioux Tribe

Mr. Michael B. Jandreau, Chairman
Lower Brule Sioux Tribe

CC
Scott Jones, Director Cultural Resources
Lower Brule Tribe

Mr. Ron His-Horse-is Thunder
Standing Rock Sioux Tribe

CC
Mr. Tim Mentz, THPO
Standing Rock Sioux Tribe

Mr. Curley Youpee, THPO
Ft. Peck Tribes

Tex Hall, Chairman
Three Affiliated Tribes Business Council

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Web site at *http://www.ferc.gov/docs-filing/elibrary.asp.* Enter the docket number (P–13357) in the docket number field to access the document. For assistance, call toll-free 1–866–208–3372.

Kimberly D. Bose,

Secretary.

[FR Doc. E9–7768 Filed 4–6–09; 8:45 am]

BILLING CODE 6717–01–P

DEPARTMENT OF ENERGY

Western Area Power Administration

DEPARTMENT OF AGRICULTURE

Rural Utility Service

Proposed PrairieWinds Project, South Dakota

AGENCIES: Western Area Power Administration, U.S. Department of Energy; Rural Utilities Service, U.S. Department of Agriculture.

ACTION: Notice of Intent to Prepare an Environmental Impact Statement and to Conduct Scoping Meetings; Notice of Floodplain and Wetlands Involvement.

SUMMARY: The Western Area Power Administration (Western), an agency within the U.S. Department of Energy (DOE), and Rural Utilities Service (RUS), an agency within the U.S. Department of Agriculture (USDA), intend to jointly prepare an environmental impact statement (EIS) for the proposed PrairieWinds Project (Project) in South Dakota. Western is issuing this Notice of Intent (NOI) to inform the public and interested parties about the proposed Project, conduct a public scoping process, and invite the public to comment on the scope, proposed action, alternatives, and other issues to be addressed in the EIS.

The EIS will address the construction, maintenance and operation of the proposed Project, which would include a 151.5-megawatt (MW) nameplate capacity wind-powered generating facility consisting of wind turbine generators, electrical collector lines, collector substation(s), transmission line(s), communications system, and service roads to access wind turbine sites. The EIS will also address the proposed interconnection with existing Western substations. The proposed Project would be located within portions of Brule, Aurora, and Jerauld counties, South Dakota or entirely within Tripp County, South Dakota.

Portions of the proposed Project may affect floodplains and wetlands, so this NOI also serves as a notice of proposed floodplain or wetland action. Western and RUS will hold public scoping meetings near the proposed Project areas to share information and receive comments and suggestions on the scope of the EIS.

DATES: Open house public scoping meetings will be held on April 28, 2009, at the Holiday Inn Express and Suites, 1360 East Highway 44, Winner, South Dakota, 57580, from 4 p.m. to 7 p.m. CDT; and on April 29, 2009, at the Commerce Street Grille, 118 N. Main Street, Plankinton, South Dakota, 57368, from 4 p.m. to 7 p.m. CDT. The public scoping period starts with the publication of this notice in the **Federal Register** and will continue through May 15, 2009. To help define the scope of the EIS, written comments should be submitted through the project's Web address: *http://www.wapa.gov/sdprairiewinds.htm*, or sent by letter, fax, or e-mail no later than May 15, 2009.

ADDRESSES: Written comments on the scope of the EIS should be addressed to Ms. Liana Reilly, Document Manager, Western Area Power Administration, Corporate Services Office, A7400, P.O. Box 281213, Lakewood, Colorado 80228–8213, fax (720) 962–7263, or sent by e-mail to *sdprairiewinds@wapa.gov*. Comments may also be submitted through the project's Web address: *http://www.wapa.gov/sdprairiewinds.htm*.

FOR FURTHER INFORMATION CONTACT: For information on the proposed Project, the EIS process, and general information about interconnections with Western's transmission system, contact Ms. Reilly at (800) 336–7288 or the address provided above. Parties wishing to be placed on the Project mailing list for future information, and to receive copies of the Draft and Final EIS when they are available, should also contact Ms. Reilly.

For information on RUS financing, contact Mr. Dennis Rankin, Project Manager, Engineering and Environmental Staff, Rural Utilities Service, Utilities Program, 1400 Independence Avenue, SW., Mail Stop 1571, Washington, DC 20250–1571, telephone (202) 720–1953 or e-mail *dennis.rankin@wdc.usda.gov*.

For general information on DOE National Environmental Policy Act (NEPA), 42 U.S.C. 4321–4347 review procedures or status of a NEPA review, contact Ms. Carol M. Borgstrom, Director of NEPA Policy and Compliance, GC–20, U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC 20585, telephone (202) 586–4600 or (800) 472–2756.

SUPPLEMENTARY INFORMATION: Western, an agency within DOE, markets Federal hydroelectric power to preference customers, as specified by law. These customers include municipalities, cooperatives, public utilities, irrigation districts, Federal and State agencies, and Native American Tribes in 15 western states, including South Dakota. Western owns and operates about 17,000 miles of transmission lines.

RUS, an agency that delivers the USDA's Rural Development Utilities Program, is authorized to make loans and loan guarantees that finance the construction of electric distribution, transmission, and generation facilities, including system improvements and replacements required to furnish and improve electric service in rural areas, as well as demand side management, energy conservation programs, and on-grid and off-grid renewable energy systems.

Basin Electric is a regional wholesale electric generation and transmission cooperative owned and controlled by its member cooperatives. Basin Electric serves approximately 2.5 million customers covering 430,000 square miles in portions of nine states, including Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota, and Wyoming.

PrairieWinds, SD1, Incorporated (PrairieWinds), is a wholly owned subsidiary of Basin Electric.

Project Description

PrairieWinds proposes to construct, own, operate, and maintain the South Dakota PrairieWinds Project, a 151.5–MW nameplate capacity wind-powered generation facility, including wind-turbine generators, electrical collector lines, collector substation(s), transmission line, communications system, and service access roads to access wind-turbine sites.

There are two possible locations for the proposed Project. One site is located on about 37,000 acres about 15 miles north of White Lake, South Dakota, within Brule, Aurora, and Jerauld counties, South Dakota. For this alternative, the requested interconnection is with Western's electric transmission system at Wessington Springs Substation, located in Jerauld County, South Dakota. The other site is located on about 83,000 acres about 8 miles south of Winner, South Dakota, entirely within Tripp County, South Dakota. If this alternative is selected, the interconnection request will be with Western's electric transmission system at Winner Substation, located in Tripp County.

The proposed Project is subject to the jurisdiction of the South Dakota Public Utilities Commission (SDPUC), which has regulatory authority for siting wind generation facilities and transmission lines within the State. PrairieWinds will submit an application for an Energy Conversion Facility Permit to the SDPUC. The SDPUC permit would authorize PrairieWinds to construct the proposed Project under South Dakota rules and regulations. Western's Federal action is to consider Basin Electric's interconnection request under Western's Open Access Transmission Service Tariff and make a decision whether to approve or deny the interconnection request. If the decision is to approve the request, Western's action would include making necessary system modifications to accommodate the interconnection of the proposed Project. PrairieWinds has requested financial assistance for the proposed Project from RUS. RUS' Federal action is whether to provide financial assistance; accordingly, completing the EIS is one requirement, along with other technical and financial considerations in processing PrairieWind's application.

Western and RUS intend to prepare an EIS to analyze the impacts of their respective Federal actions and the proposed Project in accordance with NEPA, as amended, DOE NEPA Implementing Procedures (10 CFR 1021), the CEQ regulations for implementing NEPA (40 CFR 1500–1508), and RUS Environmental Policies and Procedures (7 CFR 1794). While Western's and RUS' Federal actions would be limited to the approval or denial of the interconnection request, any modifications to Western's power system necessary to accommodate the interconnection, and providing financial assistance for the proposed Project, the EIS will also identify and address the environmental impacts of the proposed Project. The EIS will evaluate in detail the two alternatives, any other viable alternatives identified during the public scoping process, and the No Action Alternative.

Regardless of the site selected, the proposed Project would consist of four main facilities: Turbines, collector system, roads, and transmission lines. PrairieWinds plans to install 101 General Electric 1.5–MW wind turbines for the proposed Project within one of the alternative generation sites. Fifteen additional turbines may be installed within the selected site, pending future load, transmission availability, and renewable production standard requirements. Each generator would have a hub height of 262 feet and a turbine rotor diameter of 252 feet. The total height of each wind turbine would be 389 feet with a blade in the vertical position. The towers would be constructed of tubular steel, approximately 15 feet in diameter at the base, with internal joint flanges. The color of the towers and rotors would be standard white or off-white. During construction, a work/staging area at each turbine would include the crane pad and rotor assembly area. This area would measure about 190 feet by 210 feet. The turbine foundations would typically be mat foundations (inverted T-foundations) or a concentric-ring-shell foundation. The area excavated for the turbine foundations would typically be no more than 70 feet by 70 feet (approximately 0.1 acre). Pad mounted transformers 74 inches by 92 inches by 70 inches would be placed next to each turbine. In some cases, for step-and-touch voltage compliance, an area around a turbine may be covered in 4 inches of gravel, river rock or crushed stone.

Each wind turbine would be interconnected with underground power and communications cables, identified as the collector system. This system would be used to route the power from each turbine to a central collector substation(s) where the electrical voltage would be stepped up from 34.5 kilovolt (kV) to 230-kV. The collector substation(s) would be enclosed in a fence with dimensions about 350 feet by 140 feet. The underground collector system would be placed in one trench or two parallel trenches and connect each of the turbines to a central collector substation. The estimated trench length, including parallel trenches, is 317,000 feet (60 miles).

The fiber optic communication lines for the proposed Project would be installed in the same trenches as the underground electrical collector cables and connect each turbine to a proposed operations and maintenance (O&M) building and collector substation(s). It is anticipated that a 5,500-square foot (50 feet by 110 feet) O&M building would be built within the vicinity of the collector substation. The final location would be determined in consultation with future operations personnel.

New access roads would be built to facilitate both construction and maintenance of the turbines. This road network would be approximately 70 miles of new and/or upgraded roads. These roads would be designed to minimize length and construction impact. Initially, turbine access roads would be built to approximately 25-feet wide, to accommodate the safe operation of construction equipment. Upon completion of construction, the turbine access roads would be reclaimed and narrowed to an extent allowing for the routine maintenance of the facility. Existing roads, including state and county roads and section line roads, would also be improved to aid in servicing the turbine sites. Approximately 30 to 40 miles of new turbine access roads would be built and 25 to 35 miles of existing roads would be used and, where appropriate, improved.

Under one alternative, a new 230-kV transmission line would be required to deliver the power from the collector substation(s) to a new 230-kV Western interconnection point at the existing Wessington Springs Substation. The Wessington Springs Substation is located approximately 9 to 12 miles from the proposed collector substation(s). The proposed line would be built using wood or steel H-frame (two pole) structures or steel single-pole structures. The structures would be about 85 to 95 feet high and span about 800 feet.

The other alternative site, near Winner, would require 34.5-kV to 115-kV collector substation(s) as well as a 115-kV transmission line to interconnect to Western's existing 115-kV Winner Substation. Other facilities would be similar to those described for the proposed Project. Because the proposed Project may involve action in floodplains or wetlands, this NOI also serves as a notice of proposed floodplain or wetland action, in accordance with DOE regulations for Compliance with Floodplain and Wetlands Environmental Review Requirements at 10 CFR 1022.12(a). The EIS will include a floodplain/wetland assessment and, if required, a floodplain/wetland statement of findings will be issued with the Final EIS or Western's and RUS' Records of Decision.

Agency Responsibilities

Western and RUS are serving as co-lead Federal agencies, as defined at 40 CFR 1501.5, for preparation of the EIS. With this notice, Native American Tribes and agencies with jurisdiction or special expertise are invited to be cooperating agencies. Such tribes or agencies may make a request to Western to be a cooperating agency by contacting Western's NEPA Document Manager. Designated cooperating agencies have certain responsibilities to support the NEPA process, as specified at 40 CFR 1501.6(b).

Environmental Issues

This notice is to inform agencies and the public of Western's and RUS' Federal actions, and the proposed Project, and to solicit comments and suggestions for consideration in preparing the EIS. To help the public frame its comments, this notice contains a list of potential environmental issues that Western and RUS have tentatively identified for analysis. These issues include:

1. Impacts on protected, threatened, endangered, or sensitive species of animals or plants;
2. Impacts on avian and bat species;
3. Impacts on land use, recreation, and transportation;
4. Impacts on cultural or historic resources and tribal values;
5. Impacts on human health and safety;
6. Impacts on air, soil, and water resources (including air quality and surface water impacts);
7. Visual impacts; and
8. Socioeconomic impacts and disproportionately high and adverse impacts to minority and low-income populations.

This list is not intended to be all-inclusive or to imply any predetermination of impacts. Environmental issues associated with Western's action, RUS' action, and PraireWinds' proposed Project will be addressed separately in the EIS. Western and RUS invite interested parties to suggest specific issues within these general categories, or other issues not included above, to be considered in the EIS.

Public Participation

Public participation and full disclosure are planned for the entire EIS process. The EIS process will include public scoping open house meetings and a scoping comment period to solicit comments from interested parties; consultation and involvement with appropriate Federal, State, local, and tribal governmental agencies; public review and a hearing on the draft EIS; publication of a final EIS; and publication of separate Records of Decision by Western and RUS, currently anticipated in 2010. Additional informal public meetings may be held in the proposed Project areas, if public interest and issues indicate a need.

The public scoping period begins with publication of this notice in the **Federal Register** and closes May 15, 2009. The purpose of the scoping meetings is to provide information about Western's Federal action, RUS's Federal action, and the proposed Project, display maps, answer questions, and take written comments from interested parties.

Western and RUS will hold open house public scoping meetings in Plankinton, South Dakota and Winner, South Dakota as noted above. Attendees are welcome to come and go at their convenience and to speak one-on-one with Project representatives and agency staff. The public will have the opportunity to provide written comments at the meeting. In addition, attendees may provide written comments by letter, fax, e-mail, or through the project's Web address.

To be considered in defining the scope of the EIS, comments should be received by the end of the scoping period. Anonymous comments will not be accepted.

Dated: March 30, 2009.

Timothy J. Meeks,

Administrator.

Dated: March 26, 2009.

Mark S. Plank,

Director, Engineering and Environmental Staff, Rural Utilities Service.

[FR Doc. E9–7813 Filed 4–6–09; 8:45 am]

BILLING CODE 6450–01–P

ENVIRONMENTAL PROTECTION AGENCY

[FRL–8789–8; EPA–HQ–OEI–2007–1152]

Amendment to the Toxic Substances Control Act Confidential Business Information Records Access System, EPA–20

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.

SUMMARY: Pursuant to the provisions of the Privacy Act of 1974 (5 U.S.C. 552a), the Office of Pollution Prevention and Toxics is giving notice that it proposes to amend the ''Toxic Substance Control Act Confidential Business Information Records Access System'' to ''Confidential Business Information Tracking System (CBITS)'' to correct the official name of the system of record notice (SORN), system location and system manager.

DATES: Persons wishing to comment on this system of records notice must do so by May 18, 2009.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–2007–1152, by one of the following methods:

- *http://www.regulations.gov:* Follow the online instructions for submitting comments.
- *E-mail: oei.docket@epa.gov*
- *Fax:* 202–566–1752.
- *Mail:* OEI Docket, Environmental Protection Agency, Mailcode: 2822T, 1200 Pennsylvania Ave., NW., Washington, DC 20460.
- *Hand Delivery:* OEI Docket, EPA/DC, EPA West Building, Room B102, 1301 Constitution Ave., NW., Washington, DC. Such deliveries are only accepted during the Docket's normal hours of operation and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OEI–2007–1152. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov*, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information for which disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov*. The *http://www.regulations.gov* Web site is an ''anonymous access'' system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through *http://www.regulations.gov* your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at *http://www.epa.gov/epahome/dockets.htm.*

Docket: All documents in the docket are listed in the *http://www.regulations.gov* index. Although listed in the index, some information is not publicly available, e.g., CBI or other information for which disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either

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PRSRT STD
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Phoenix AZ
Permit #1039

Ms. Liana Reilly
Document Manager
Western Area Power Administration
Corporate Services Office - A7400
P.O. Box 281213
Lakewood, Colorado 80228-8213

YOU ARE INVITED!

TO A PUBLIC MEETING

The USDA Rural Utilities Service (RUS) and Western Area Power Administration (Western) are hosting two open-house public meetings to discuss a new 150-megawatt wind energy project.

PrairieWinds SD1, Inc., (PrairieWinds), a subsidiary of Basin Electric Power Cooperative, proposes to construct 101 wind turbines in one of two alternate locations. One location would be south of Wessington Springs, approximately **10 miles north of the town of White Lake**, in Aurora, Jerauld and Brule counties in South Dakota. The other location would be approximately **15 miles south of the town of Winner**, in Tripp County, South Dakota.

Representatives from RUS, Western and PrairieWinds will be available to answer your questions, offer more information about the proposed project and take your comments. Your comments will help define the scope of the Environmental Impact Statement.

PLEASE JOIN US

April 28, 2009, 4:00 p.m. to 7:00 p.m.
Holiday Inn Express & Suites
1360 E Highway 44
Winner, SD 57580

April 29, 2009, 4:00 p.m. to 7:00 p.m.
Commerce Street Grille
118 S Main Street
Plankinton, SD 57368

NEED MORE INFORMATION?

Liana Reilly
Western Area Power Administration
Corporate Services Office
A7400 P.O. Box 281213
Lakewood, Colorado 80228-8213
email: sdprairiewinds@wapa.gov
Phone: 1-800-336-7288

Western AREA POWER ADMINISTRATION

USDA Rural Development

Or visit the Project Web site at:
www.wapa.gov/transmission/sdprairiewinds.htm

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Appendix B

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Appendix B

Engineering Drawings

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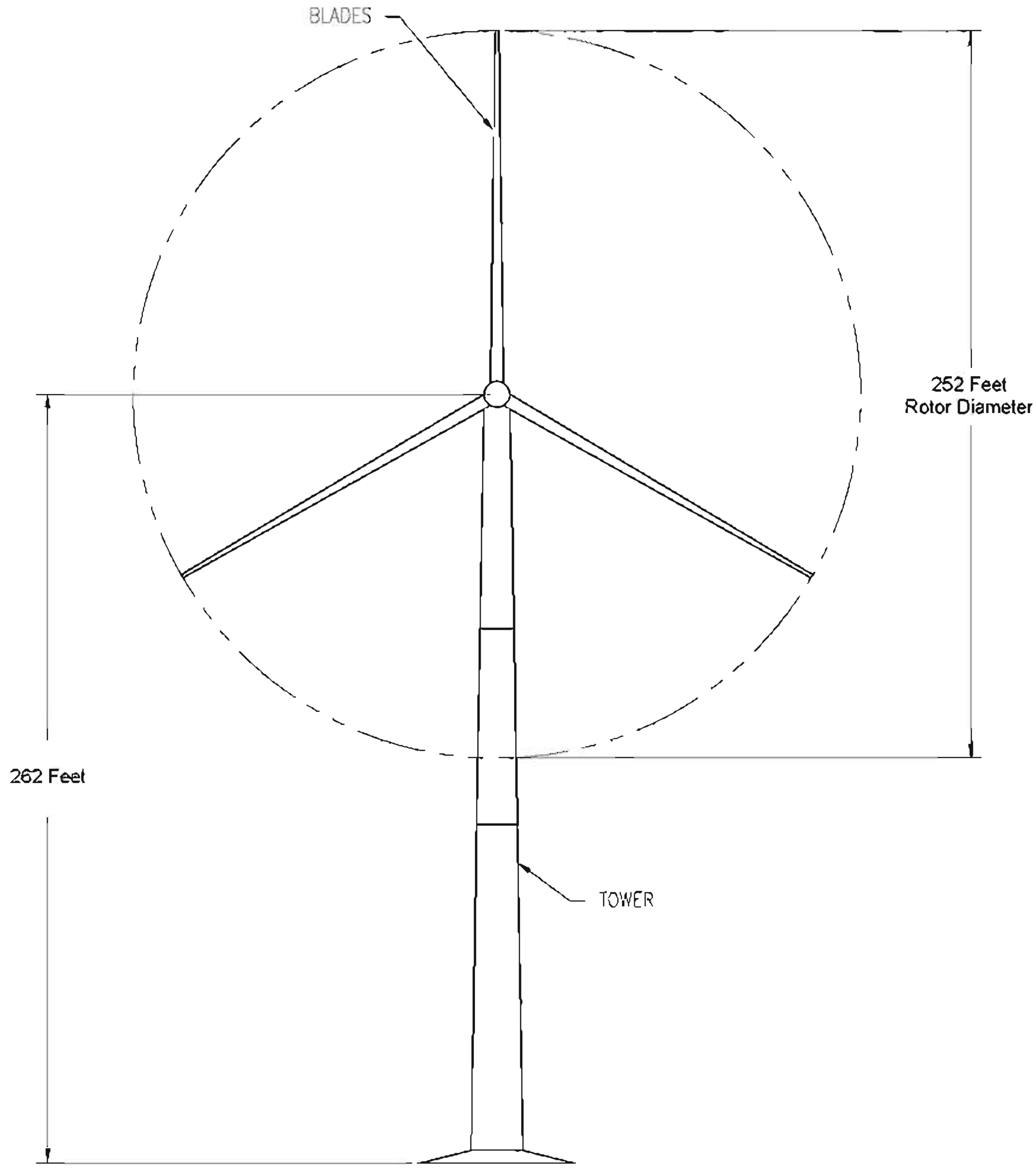

GE WIND ENERGY 1.5 SLE 60 HZ WIND TURBINE

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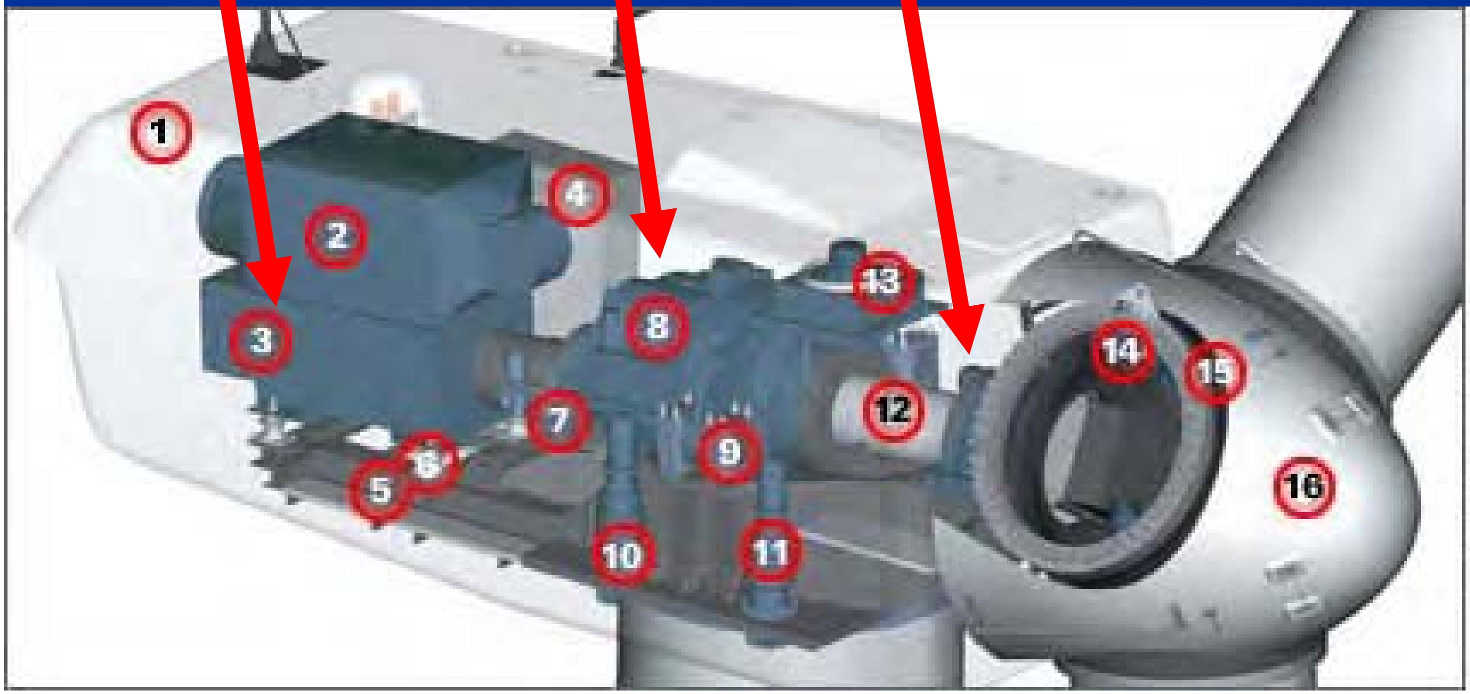
3 Major Components of Turbines

Generator

Gearbox

Rotor/Blades/Main Shaft



1. Nacelle
2. Heat Exchanger
3. Generator
4. Control Panel
5. Main Frame
6. Impact Noise Insulation
7. Hydraulic Parking Brake
8. Gearbox
9. Impact Noise Insulation
10. Yaw Drive
11. Yaw Drive
12. Rotor Shaft
13. Oil Cooler
14. Pitch Drive
15. Rotor Hub
16. Nose Cone

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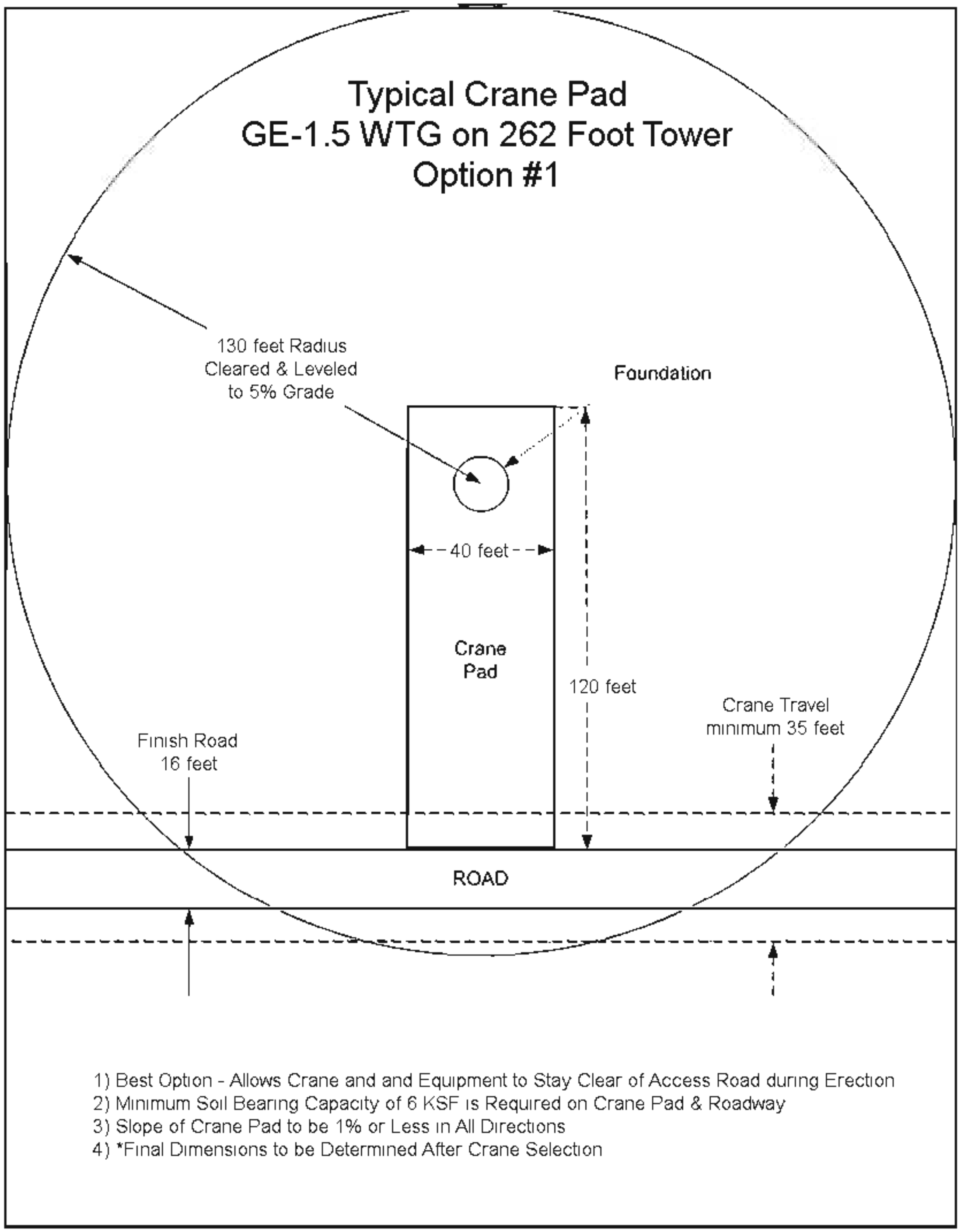

Typical Crane Pad Option 1

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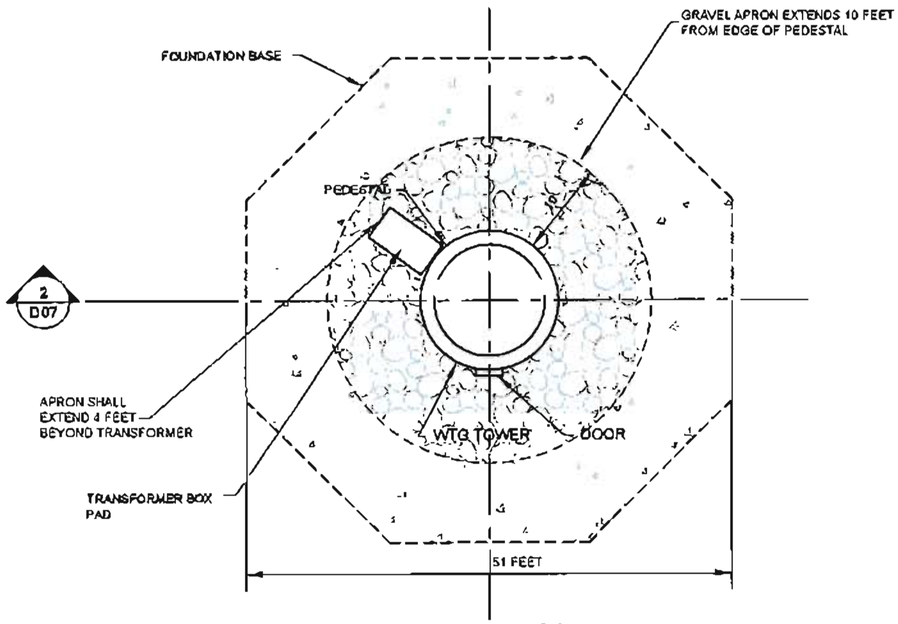
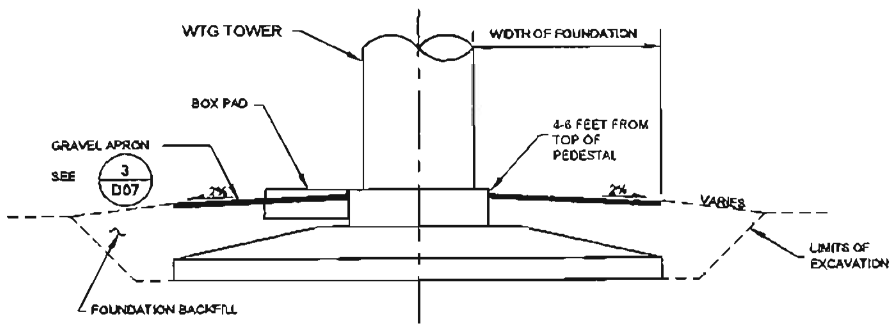
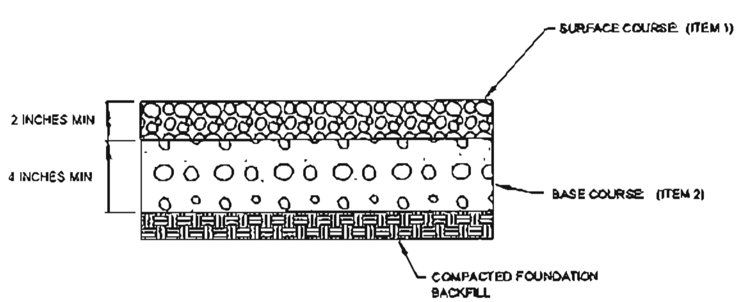


1
D07
TURBINE APRON
PLAN VIEW
(NOT TO SCALE)



2
D07
TURBINE APRON
PROFILE VIEW



3
D07
GRAVEL APRON CROSS SECTION
(NOT TO SCALE)

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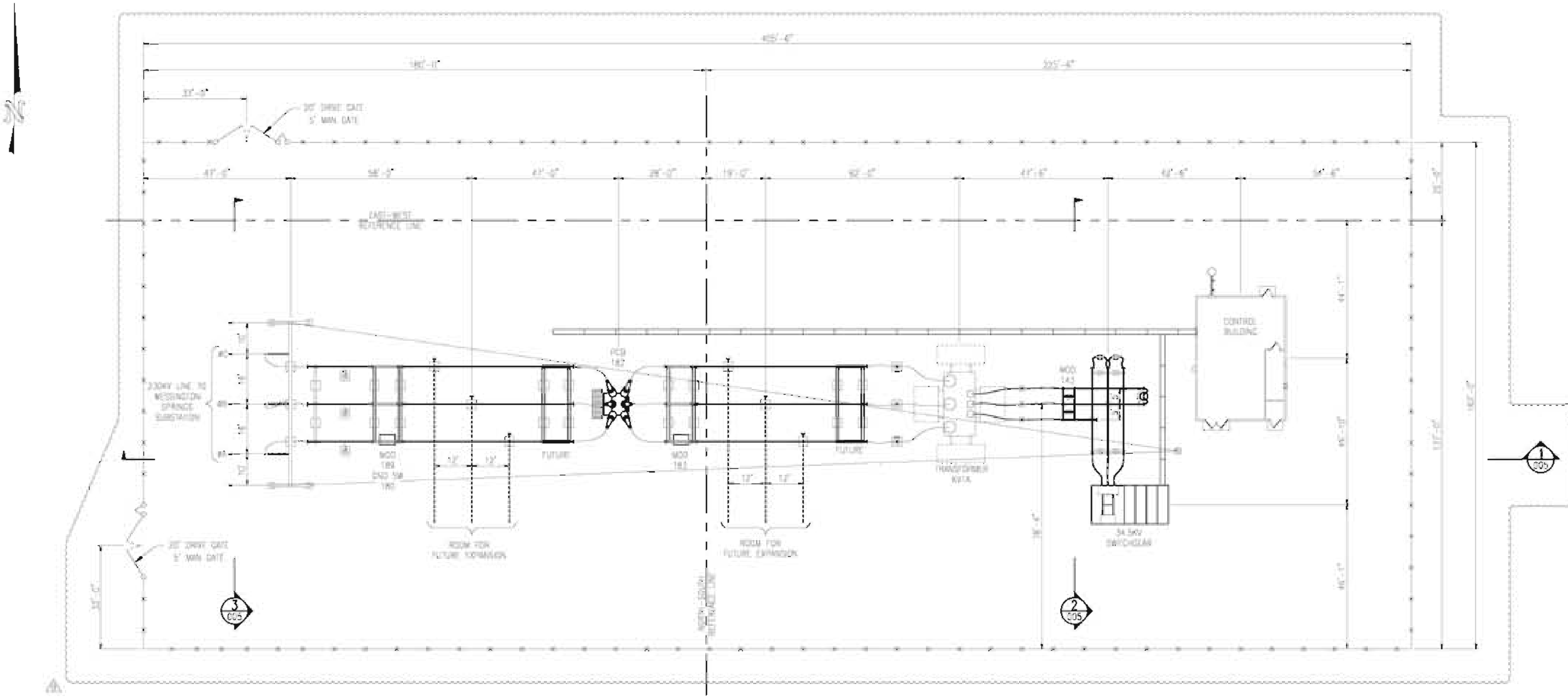

ELECTRICAL BUS ARRANGEMENT

TYPES OF CONNECTIONS

BEPC SUBMITTAL REVIEW

TO BE COMPLETED OR VERIFIED:

1. PCB SIZE
2. XFMR SIZE
4. CABLE TRENCH SIZE

PRELIMINARY

REV	DESCRIPTION	DWN	CHK	APPD	DATE
B	REVISED PER BEPC COMMENTS		JOHNSON	–	
A	ISSUED FOR REVIEW		JOHNSON	–	

REFERENCE DRAWINGS

BASIN DRAWING NUMBER	
443-054-E3-003	230KV ELECTRICAL LAYOUT PLAN
443-054-E3-004	34.5KV ELECTRICAL LAYOUT PLAN
443-054-E3-005	34.5/230KV ELECTRICAL LAYOUT ELEVATIONS
443-054-E4-001	34.5KV & 230KV ELEC. LAYOUT DETAILS SH. 1 OF 2
443-054-E4-002	34.5KV & 230KV ELEC. LAYOUT DETAILS SH. 2 OF 2

TRANSMISSION SYSTEM MAINTENANCE

443-34.5/230KV CROW LAKE COLLECTOR SUBSTATION

ELECTRICAL BUS ARRANGEMENT

BASIN ELECTRIC POWER COOPERATIVE

443-054-E3-001 B

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Appendix C

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Appendix C

Biological Resources

- USFWS interagency letter dated April 9, 2009
- USFWS scoping response letter dated May 13, 2009
- USFWS request for Federally listed species dated October 14, 2009
- USFWS request response letter dated November 12, 2009
- **Table C-1** Wildlife Species Observed in the Crow Lake Alternative (2008-2009 Field Surveys)
- **Table C-2** Summary of individuals and group observations for fixed-point bird use surveys at the PrairieWinds SD1 Crow Lake Wind Resource Area, March 19 – May 27, 2009
- **Table C-3** Total number of groups and individuals for each bird type and species observed during transect bird use surveys at the PrairieWinds SD1 Crow Lake Wind Resource Area, June 2 – July 7, 2009
- **Table C-4** Wildlife Species Observed in the Winner Alternative (2008-2009 Field Surveys)
- **Table C-5** Summary of individuals and group observations for fixed-point bird use surveys at the PrairieWinds SD1 Winner Wind Resource Area, April 6 – May 22, 2009
- **Table C-6** Total number of groups and individuals for each bird type and species observed during transect bird use surveys at the PrairieWinds SD1 Winner Wind Resource Area, June 12 – July 10, 2009

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April 09, 2009

Pete Gober
US Fish and Wildlife Service
Ecological Services Field Office
420 S. Garfield Avenue, Suite 400
Pierre, SD 57501-5408

Dear Pete Gober:

The purpose of this letter is to inform you of a proposed project and to provide notice that Western and RUS intend to prepare an Enivornmental Impact Statement (EIS) addressing their respective Federal actions. This letter also serves as an invitation for an interagency meeting as well as provides information to you about our scoping process.

PrairieWinds SD1, Incorporated (PrairieWinds), a subsidiary of Basin Electric Power Cooperative (Basin Electric), has proposed to develop a wind-powered generating facility in south-central South Dakota, either near Wessington Springs or near Winner. Basin Electric has requested to interconnect the proposed project with Western Area Power Administration's (Western) transmission system. PrairieWinds has requested financing for the proposed project from the Rural Utilities Service (RUS), an agency within the U.S. Department of Agriculture (USDA).

Basin Electric's generator interconnection request and PrairieWinds's financing request triggers a National Environmental Policy Act (NEPA) review process of the proposed project by Western and RUS, respectively. Western and RUS are serving as co-lead Federal agencies for preparation of the EIS. Western will serve as the lead Federal agency for consultations with the U.S. Fish and Wildlife Service under section 7 of the Endangered Species Act and for consultations with the South Dakota State Historic Preservation Office under section 106 of the National Historic Preservation Act.

Western and RUS invite you to attend an interagency meeting occurring on April 28, 2009 to provide you input on the proposed project's scoping process. During the meeting we would like

to discuss the project component details, obtain input to understand any issues that your Agency believes are important in the EIS analysis, and review the project schedule. The interagency meeting details are as follows:

Best Western Ramkota Hotel
920 W Sioux Ave
Pierre, South Dakota 57501-1800
Tuesday, April 28, 2009
9 a.m. to 11 a.m.

In addition, this letter serves to invite your agency to become a cooperating agency in the EIS process for the proposed project. The Council on Environmental Quality NEPA Implementing Regulations (40 CFR part 1501.6) emphasizes agency cooperation and authorizes the designated lead Federal agency to request that other Federal agencies with jurisdiction by law be a cooperating agency. Additionally, the lead Federal agency may request that any other Federal agency with special expertise with respect to any environmental issue to be addressed in the EIS also be a cooperating agency. Designated cooperating agencies have certain responsibilities to support the NEPA process, as specified in 40 CFR 1501.6 (b). The benefits of becoming a cooperating agency include disclosure of relevant information early in the EIS process and establishment of a mechanism to address any intergovernmental issues. Should your agency decide not to become a formal cooperating agency for the EIS, you will continue to be kept informed of project developments through the project mailing list, and you will receive the draft and final EIS documents. Any concerns or comments your agency provides to us during the NEPA process, and in a timely fashion, will be fully considered in finalizing the EIS and our Records of Decision (RODs).

The proposed PrairieWinds project would involve the installation and operation of a 150-megawatt (MW) wind energy facility that would feature 101 wind turbine generators. Each turbine generator would have a hub height of 262 feet and a turbine rotor diameter of 252 feet. The total height of each wind turbine would be 389 feet with a blade in the vertical position. The towers would be constructed of tubular steel, approximately 15 feet in diameter at the base, with internal joint flanges. The color of the towers and rotors would be standard white or off-white. During construction, a work/staging area at each turbine would include the crane pad and rotor assembly area, temporarily disturbing an area about 190 feet by 210 feet.

Each wind turbine would be connected by a service road for access and a 34.5-kilovolt (kV) buried electrical collection system that would ultimately route the power from each turbine to a central collector substation, where voltage would be stepped up for interconnection to Western’s transmission system. About 30 to 40 miles of new access roads would be built to facilitate both

construction and maintenance of the turbines. Approximately 25 to 35 miles of existing roads would be used and, where appropriate, improved.

Two sites for the wind-powered generation facility are under consideration (see enclosed map). One site is located on about 37,000 acres and is approximately 15 miles north of White Lake, South Dakota, within Brule, Aurora, and Jerauld counties. The other alternative site would be located within an area about 83,000 acres, and is about 8 miles south of Winner, South Dakota, and is entirely within Tripp County.

The site that is approximately 37,000 acres near White Lake, South Dakota, would require a new 230-kV transmission line to deliver the power from the collector substation(s) to a new 230-kV Western interconnection point at Western's Wessington Springs Substation, located in Jerauld County. The Wessington Springs Substation is located approximately 9 to 12 miles from the proposed collector substation(s). The proposed line would be built using wood or steel H-frame (two pole) structures or steel single-pole structures. The structures would be about 85 to 95 feet high and span about 800 feet.

The other alternative site, approximately 83,000 acres near Winner, South Dakota, would require a 34.5-kV to 115-kV collector substation(s) as well as a 115-kV transmission line to interconnect to Western's existing 115-kV Winner Substation. Other facilities necessary for this site would be similar to those described for the site above.

The no action alternative will also be considered.

There is a chance that the final interconnection studies will conclude that other transmission facilities, such as network upgrades remote from the project site, would be required. If the project moves forward and it is determined that other facilities are needed to support the interconnection request, Western and RUS will complete the appropriate level of environmental review.

We want to ensure that any important environmental concerns and natural resources and/or places of interest for your Agency within the project area are considered and addressed in the EIS. At this time, we would appreciate receiving any information that you would be willing to share with us on any unique or special resources or areas in or near the proposed project. If you are aware of any other individuals or affiliated organizations that should be consulted regarding this project, please let us know. A full list of all other agencies and individuals receiving this letter is enclosed.

If any additional agency representatives wish to be added to the project's mailing list and/or receive a copy of the Draft and Final EIS, please contact Ms. Liana Reilly or Mr. Dennis Rankin

at the phone numbers or addresses listed below. Comments on the project scope and alternatives should be received by May 15, 2009, to be considered in defining the scope for the Draft EIS. Comments on the proposed project will be accepted and considered throughout the NEPA process.

At this time, Western and RUS are conducting scoping, including public scoping meetings, to ensure that interested members of the public, potentially affected landowners and lessees, and Federal, state, local, and tribal agencies have an opportunity to provide input on the scope of the EIS and the alternatives that will be addressed in the EIS. Western, RUS, and PrairieWinds representatives will be available at the scoping meetings for one-on-one discussions, to provide information about the proposed project, answer questions, and will take verbal and written comments from interested parties. Information will be available at two public scoping meetings as follows:

Holiday Inn Express and Suites
1360 East Highway 44
Winner, South Dakota 57580
Tuesday, April 28, 2009
4 p.m. to 7 p.m.

Commerce Street Grille
118 North Main Street
Plankinton, South Dakota 57368
Wednesday, April 29, 2009
4 p.m. to 7 p.m.

During this scoping phase, we would like to obtain input to understand any issues that your Agency believes are important. Western and RUS request that you comment on the proposal, offer suggestions to improve the proposal and suggest alternative actions. Please identify any issues of concern about potential environmental impacts. Please address comments, questions or concerns to Ms. Liana Reilly or Mr. Dennis Rankin at the addresses below.

Ms. Liana Reilly
Document Manager
Western Area Power Administration
Corporate Services Office - A7400,
P.O. Box 281213
Lakewood, Colorado 80228-8213
Phone: (720) 962-7253 or (1-800) 336-7288
Fax: (720) 962-7263
E-mail: reilly@wapa.gov

Mr. Dennis Rankin
Project Manager
Engineering and Environmental Staff
Rural Utilities Service, Utilities Program

1400 Independence Ave. SW, Mail Stop 1571
Washington D.C. 20250-1571,
Phone: (202) 720-1953
Fax: (202) 720-0820
E-mail: dennis.rankin@wdc.usda.gov

We look forward to hearing from you.

Sincerely,

Nicholas J Stas

Nick Stas
Environmental Manager
Upper Great Plains Region
Western Area Power Administration

Enclosures

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

May 13, 2009

Ms. Liana Reilly, Document Manager
Western Area Power Administration
Corporate Services Office, A7400
P.O. Box 281213
Lakewood, Colorado 80228-8213

Mr. Dennis Rankin, Project Manager
Engineering and Environmental Staff
Rural Utilities Service, Utilities Program
1400 Independence Avenue SW, Mail Stop 1571
Washington D.C. 20250-1571

Re: Notice of Intent to Prepare an Environmental Impact Statement for Prairie Winds SD1 Wind Farm, South Dakota

Dear Ms. Reilly and Mr. Rankin:

This letter is in response to your April 9, 2009, letter regarding the Notice of Intent to prepare an Environmental Impact Statement (EIS) for the above referenced project; a 150-megawatt, 101-turbine wind-powered generating facility proposed for south-central South Dakota to be located either near the town of Wessington Springs or the town of Winner. Coordination with the U.S. Fish and Wildlife Service (Service) has already been initiated for this project by your agencies and the applicant, Prairie Winds SD1, Inc. (a subsidiary of Basin Electric Power Cooperative), and their consultants. As part of this continued coordination effort, we herein submit formal comments on this project by the May 15, 2009, deadline as requested in your letter to assist in the development of the upcoming EIS.

The two sites being considered for placement of this wind farm are: 1) the Crow Lake Site (37,000 acres in Brule, Aurora, and Jerauld Counties) and 2) the Winner Site (83,000 acres in Tripp County). Per your letter, the proposed turbines will be 389 feet tall with turbine rotor diameters of 252 feet. The towers will be 15 feet wide at the base, placed on a concrete pad, temporarily disturbing a 190 x 210 foot area per turbine during construction. Thirty (30) to 40 miles of new access roads are planned, and a buried collection system will electrically connect the turbines to a substation where voltage can be stepped up for interconnection with the Western Area Power Administration's (WAPA) transmission line. Construction of up to perhaps 12 miles of overhead high voltage transmission lines (34.5-115 kV) and other associated appurtenances will be required at both locations.

It is our understanding that the U.S. Department of Agriculture's Rural Utilities Service may provide funding for this project, and the WAPA is considering an interconnection request by Prairie Winds SD1 to WAPA's existing transmission lines. While your agencies are the Federal co-leads for this project, it has been decided that the WAPA will lead the section 7 process under the Endangered Species Act (ESA).

Your letter included an invitation to an agency meeting on April 28, 2009, which Natalie Gates of this office attended, plus an invitation to become a cooperating agency in the development of the EIS for this project. Mr. Harris Hoistad of our Huron Wetland Management District (WMD) also attended the April 28, 2009, meeting, and had indicated his interest in representing the Service as a cooperating agency for this project at that meeting. The Huron WMD administers Service fee title and easement properties in some of the counties proposed for construction. While Mr. Hoistad accepts your invitation and shall serve as your primary contact in that regard, we respectfully request that you include this office in such cooperating agency correspondences as well, thereby allowing the opportunity for input from the Ecological Services branch of the Service in addition to the Refuges program perspective provided by the Huron WMD. Natalie Gates will continue to serve as your Ecological Services contact.

Federally Listed Species

In accordance with section 7(c) of the ESA, as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species may occur in the project area(s) (this list is considered valid for 90 days):

Species	Status	Expected Occurrence
Whooping crane (Grus americana)	Endangered	Migration
American burying beetle (Nicrophorus americanus)	Endangered	Resident, Tripp County
Piping plover (Charadrius melodus)	Threatened	Migration
Topeka shiner (Notropis topeka)	Endangered	Known resident , waterways in Jerauld and Aurora Counties

Whooping cranes migrate through central South Dakota on their way to northern breeding grounds and southern wintering areas. They occupy numerous habitats such as cropland and pastures; wet meadows; shallow marshes; shallow portions of rivers, lakes, reservoirs, and stock ponds; and both freshwater and alkaline basins for feeding and loafing. Overnight roosting sites frequently require shallow water in which to stand and rest. If whooping crane stopover habitat exists within either proposed project site, potential whooping crane impacts should be considered. Whooping cranes are large birds with low maneuverability. Line strike mortality is the greatest known threat to fledged whooping cranes. Whooping crane interactions with wind turbines are not currently known; however, collisions with turbines may be possible, and/or loss of stopover habitat in the migration corridor may be realized if whooping cranes tend to avoid wind farms. Additionally, should construction occur during spring or fall migration, the potential for disturbances exists, stressing the whooping cranes at critical times of the year. Any whooping crane sightings should be reported to the Service; a standard reporting form is available from this office.

The American burying beetle is a known resident of southern Tripp County and has also been documented within Bennett, Todd, and Gregory Counties. Recent studies have shown some preference by this species for sandy or sandy-loam grasslands with interspersed stands of low-meadow cottonwoods; however, they will use various types of soil and habitat if the right type of food is available. The life cycle of the American burying beetle includes time spent underground during the summer months as eggs, larvae, and pupae, with adults present for part of that time; thus, the potential exists to excavate American burying beetles during June, July, and August. Adults are also present underground during winter, so it is possible to destroy American burying beetles via ground disturbance as they hibernate. These potential affects to the American burying beetle should be considered at the proposed Winner Site.

Piping plovers may occur within the proposed project areas although, in South Dakota, this shorebird species occupies habitat primarily along the Missouri River; thus, any birds present at either proposed wind turbine site would likely be passing over/through the site during migration to breeding/wintering areas. The species has been known to collide with overhead power lines; interactions with wind turbines are unknown. Piping plovers use sparsely vegetated interchannel sandbars, islands, and shorelines for nesting, foraging, and brood-rearing. The birds typically breed in South Dakota between the dates of May 1 and August 15.

Topeka shiners occupy tributaries within the Big Sioux, Vermillion, and James River watersheds in eastern South Dakota. Firesteel Creek, West Branch of Firesteel Creek, and Dry Run Creek are waterways in Jerauld and Aurora Counties that are known to be occupied by this minnow species. Should the Crow Lake Site be selected and the project involves direct or indirect impacts to these known occupied waterways or other tributaries to the James River, potential effects to the Topeka shiner should be considered. Examples may include power line/road crossings of these streams or upland construction adjacent to these waterways that could result in instream sedimentation.

If the WAPA or their designated representative determines that the project "may adversely affect" listed species in South Dakota, it should request formal consultation from this office. If a "may affect - not likely to adversely affect" determination is made for this project, it should be submitted to this office for concurrence. If a "no effect" determination is made, further consultation may not be necessary. However, a copy of the determination should be sent to this office.

Wind Energy and Wildlife

Among the Service's primary concerns regarding wind turbines are avian collision mortality and the loss of habitat/habitat avoidance behaviors by wildlife. While there is still much to be learned regarding wind turbine-wildlife interactions, we do know that wind turbines can have adverse impacts on some species. Turbine location, spacing, aspect, lighting, size, and design are all potential factors related to the risk posed to resident and migratory wildlife as are the types of surrounding habitats, use of these habitats by various species of wildlife, landscape features, prey base, migration corridors, and behavioral patterns. Recent studies of grassland nesting birds have shown a tendency for avoidance of areas immediately surrounding turbines causing an indirect loss of habitat. Direct loss of habitat caused by the footprint of the turbines and associated roads and structures is another concern, along with loss of habitat that can occur with encroachment of invasive weeds as a result of these disturbances. Currently, perhaps the best means of minimizing impacts to wildlife is to avoid constructing within high wildlife use areas. Placement of turbines within existing cropland is recommended for this reason. When unavoidable impacts to fish and wildlife species and their habitats are anticipated, we recommend that offsetting measures be developed and implemented. We encourage inclusion of a mitigation plan within the draft EIS to serve this purpose.

Wind Turbine Guidelines

You are aware that the Service has developed voluntary "*Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines*" (available online at http://www.fws.gov/habitatconservation/Service%20Interim%20Guidelines.pdf.) to assist energy companies in accomplishing the goal of reducing the risk posed by turbines to wildlife. The guidelines stress the importance of proper evaluation of potential wind turbine development sites, appropriate location and design of turbines and related facilities, and pre- and post-construction research and monitoring. Potential Impact Index (PII) scores, as recommended by our guidelines, were developed for each proposed site (results: PIIs of 269 and 239 for Winner and Crow Lake sites, respectively) and a reference site (result: PII of 331) located near the Lake Andes/Karl Mundt National Wildlife Refuges, South Dakota. Again, please note that previously disturbed sites (e.g., cropland) are recommended areas for turbines to minimize habitat loss and associated wildlife impacts. If construction must occur within intact native grasslands, offsetting and/or mitigative measures should be considered for the conservation of prairie wildlife, particularly migratory birds.

The South Dakota Department of Game, Fish and Parks (SDDGFP) has coordinated with the South Dakota Public Utilities Commission (SDPUC) regarding distribution of the SDDGFP's "*Siting Guidelines for Wind Power Projects in South Dakota*" to wind developers intending to construct projects within the state of South Dakota. You may wish to contact the SDPUC and/or the Wildlife Diversity Division of the SDDGFP in Pierre, South Dakota, for more information. Contact information may be found on their respective websites: http://puc.sd.gov/ and http://www.sdgfp.info/Wildlife/Diversity/index.htm. The guidelines themselves may be found online at: http://www.sdgfp.info/wildlife/ diversity/windpower.htm.

Birds of Conservation Concern

The Migratory Birds Division of the Service has published *"Birds of Conservation Concern 2008"* (http://www.fws.gov/migratorybirds/reports/BCC2008/BCC2008.pdf). This document is intended to identify species in need of coordinated and proactive conservation efforts among State, Federal, and private entities with the goals of precluding future evaluation of these species for ESA protections and promoting/conserving long-term avian diversity. We refer you to page 71 (Table 46) of that report for a list of birds of conservation concern in Region 6 (the Service Region where your project is proposed). Recent avian surveys at other sites in central South Dakota have documented numerous species that are included in Region 6's Birds of Conservation Concern list, such as northern harrier, upland sandpiper, marbled godwit, burrowing owl, grasshopper sparrow, chestnut-collared longspur, and bobolink. Depending upon available habitat, it is likely that some/all of these and perhaps other species of concern may be found in either the Winner or Crow Lake Sites. A primary threat to these species is habitat loss and fragmentation. In accordance with the National Environmental Policy Act and Executive Order 13186 regarding migratory bird protection/conservation, we recommend avoidance, minimization, and finally, offsetting measures to reduce the unavoidable impacts to species protected by the Migratory Bird Treaty Act (MBTA). MBTA compliance may be partially addressed in an Avian and Bat Protection Plan (see below); however, a separate mitigation plan that specifically addresses direct and indirect take of birds during and after construction (via collision, habitat loss, and habitat avoidance) is also recommended. This office can assist with development of such a plan.

Meteorological Towers

Meteorological towers constructed in association with wind turbines are often similar in design to typical communications towers: tall, lighted, lattice structured, and guyed. These types of towers can be problematic for birds, particularly during inclement weather, as they enter the lighted area, become reluctant to leave it, and suffer mortality as they circle the structure and collide with the guy wires or the lattice of the tower itself. We are aware that meteorological towers already exist at the proposed sites but are uncertain of the tower designs. Guidance set forth in "*U.S. Fish and Wildlife Service Interim Guidelines for Recommendations on Communications Tower Siting, Constructions, Operation and Decommissioning*" may be found online at http://www.fws.gov/habitatconservation/communicationtowers.html. We recommend adherence to these guidelines for construction of new towers and retrofitting of existing towers to minimize the threat of avian mortality at these structures. Please note that it may be possible to apply some of these guidelines to the turbine towers as well.

In order to obtain information on the usefulness of the communications tower guidelines in preventing birds strikes and to identify any recurring problems with their implementation which may necessitate modifications, please advise us of the final location and specifications of any towers associated with the wind turbine project and which of the measures recommended for the protection of migratory birds were implemented. If any of the recommended measures cannot be implemented, please explain why they were not feasible. A Tower Site Evaluation Form is also available via the above communications tower website:

(http://www.fws.gov/habitatconservation/communicationtowers.html). Please complete this form and forward it to our office.

Power Lines

The construction of additional overhead power lines associated with wind farms creates the threat of avian electrocution, particularly for raptors. Thousands of these birds, including endangered species, are killed annually as they attempt to utilize overhead power lines as nesting, hunting, resting, feeding, and sunning sites. The Service recommends the installation of underground, rather than overhead, power lines whenever possible and appropriate to minimize environmental disturbances. For all new overhead lines or modernization of old overhead lines, we recommend incorporating measures to prevent avian electrocutions. The publication entitled "*Suggested Practices for Avian Protection on Power Lines - The State of the Art in 2006*" has many good suggestions including pole extensions, modified positioning of live phase conductors and ground wires, placement of perch guards and elevated perches, elimination of cross arms, use of wood (not metal) braces, and installation of various insulating covers. You may obtain this publication by contacting the Edison Electric Institute via their website at www.eei.org or by calling 1-800-334-5453.

Please note that utilizing just one of the "*Suggested Practices . . .*" methods may not entirely remove the threat of electrocution to raptors. In fact, improper use of some methods may increase electrocution mortality. Perch guards, for example, may be only partially effective as some birds may still attempt to perch on structures with misplaced or small-sized guards and may suffer electrocution as they approach too close to conducting materials. Among the most dangerous structures to raptors are poles that are located at a crossing of two or more lines, exposed above-ground transformers, or dead end poles. Numerous hot and neutral lines at these sites, combined with inadequate spacing between conductors, increase the threat of avian electrocutions. Perch guards placed on other poles have in some cases served to actually shift birds to these more dangerous sites, increasing the number of mortalities. Thus, it may be necessary to utilize other methods or combine methods to achieve the best results. The same principles may be applied to substation structures.

Please also note that the spacing recommendation within the "*Suggested Practices . . .*" publication of at least 60 inches between conductors or features that cause grounding may not be protective of larger raptors such as eagles. This measure was based on the fact that the skin-to-skin contact distance on these birds (i.e., talon to beak, wrist to wrist, etc.) is less than 60 inches. However, an adult eagle's wingspan (distance between feather tips) may vary from 66 to 96 inches depending on the species (golden or bald) and gender of the bird. Unfortunately, wet feathers in contact with conductors and/or grounding connections can result in a lethal electrical surge. Thus, the focus of the above precautionary measures should be to a) provide more than 96 inches of spacing between conductors or grounding features, b) insulate exposed conducting features so that contact will not cause raptor electrocution, and/or c) prevent raptors from perching on the poles in the first place.

Additional information regarding simple, effective ways to prevent raptor electrocutions on power lines is available in video form. *"Raptors at Risk"* may be obtained by contacting EDM International, Inc. at 4001 Automation Way, Fort Collins, Colorado 80525-3479, Telephone No. (970) 204-4001, or by visiting their website at http://www.edmlink.com/raptorvideo.htm.

In addition to electrocution, overhead power lines also present the threat of avian line strike mortality. Particularly in situations where these lines are adjacent to large wetlands or where waters exist on opposite sides of the lines, we recommend marking them in order to make them more visible to birds. For more information on bird strikes, please see *"Mitigating Bird Collisions With Power Lines: The State of the Art in 1994"* which may be obtained by contacting the Edison Electric Institute at the same website and telephone number listed above. While line marking is recommended to reduce the risk of collision, it does not preclude line strike mortality entirely. Thus, marking of additional, existing overhead lines is recommended as a means to further mitigate the potential for line strike mortality to migratory birds, including threatened/endangered species such as the whooping crane.

Avian and Bat Protection Plans

The Service has coordinated with the Avian Power Line Interaction Committee (APLIC) to develop guidelines to assist companies in formulating Avian Protection Plans (APP). APPs are utility-specific and designed to reduce avian and operational risks that result from avian interactions with electric utility facilities, but they may be adapted to wind energy facilities as well and include consideration of bat species which are known to suffer mortality at wind farms. We encourage the project developer of the proposed wind farm to investigate the formulation of an A(and B [bat])PP and incorporate that into the draft EIS. The guidelines may be accessed at APLIC's website at http://www.aplic.org/.

MBTA and Bald and Golden Eagle Protection Act (BGEPA)

Although the Service's tower, utility, and wind turbine guidelines will provide some protection for migratory birds, implementation of these measures alone will not remove any liability should violations of the law occur. Please be apprised of the potential application of the MBTA of 1918, as amended, 16 U.S.C. 703 et seq., and the BGEPA of 1940, as amended, 16 U.S.C. 668 et seq., to your project. The MBTA does not require intent to be proven and does not allow for "take," except as permitted by regulations. Section 703 of the MBTA provides: "Unless and except as permitted by regulations . . . it shall be unlawful at any time, by any means, or in any manner, to . . . take, capture, kill, attempt to take, capture, or kill, possess . . . any migratory bird, any part, nest, or eggs of any such bird . . . ." The BGEPA prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing activities.

It is understood that some birds may be killed even if all reasonable conservation measures are implemented. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement and through fostering relationships with individuals and industries seeking to eliminate their impacts to migratory birds. While it is not possible under the MBTA and the BGEPA to absolve individuals or companies from liability by following these guidelines, enforcement will be focused on those individuals or companies that take migratory birds with disregard for the law and where no legitimate conservation measures have been applied.

Bats

Bats are known to suffer mortality due to direct collisions with wind turbines, and it has been recently determined that many also die as a result of air pressure changes at the turbine blades that cause internal injuries. The SDDGFP has completed a state management plan for bats and may be able to provide additional information and/or recommendations regarding this project. If you have not already done so, please contact Silka Kempema at the SDDGFP-Wildlife Division, Joe Foss Building, 523 East Capitol Avenue, Pierre, South Dakota 57501, Telephone No. (605) 773-2742, for more information.

U.S. Geological Survey (USGS) Research

The Northern Prairie Wildlife Research Center of Jamestown, North Dakota, has initiated studies of avian responses to wind turbines in both North Dakota and South Dakota. Their research may be relevant to your project, depending on habitat within the project area(s). We recognize that a consultant has already been hired for the Prairie Winds Project and that wildlife surveys are currently underway as of this writing. However, we recommend that you contact Ms. Jill Shaffer of the Northern Prairie Wildlife Research Center at (701) 253-5547 for more information about the USGS project; the preliminary results of that ongoing study appear pertinent to Prairie Winds.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide scoping comments and looks forward to development of the draft EIS. If you have any questions on these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 234.

Sincerely,

Scott Larson

Acting For

Pete Gober
Field Supervisor
South Dakota Field Office

OCT 1 4 2009

Mr. Pete Gober, Field Supervisor
U.S. Fish and Wildlife Service
South Dakota Field Office
420 South Garfield Ave., Suite 400
Pierre, South Dakota 57501-5408

RE: Endangered Species Act Section 7 Consultation, Proposed Prairie Winds SD1 Wind Energy Facility, Aurora, Brule, Jerauld, and Tripp Counties, South Dakota

Dear Mr. Gober:

The U.S Department of Energy's Western Area Power Administration (Western), and the U.S. Department of Agriculture's Rural Utilities Service (RUS) [the Agencies] are currently considering whether to provide electrical interconnection and financing, respectively, for the construction of a 150-MW wind generating facility on one of two proposed sites in the subject counties. The proposed facility called Prairie Winds SD1 would be developed, constructed, and operated by Prairie Winds SD1 Incorporated, a wholly owned subsidiary of Basin Electric Power Cooperative, Inc., of Bismarck, ND.

Western and RUS are the co-lead Federal agencies responsible for compliance with the National Environmental Policy Act (NEPA) and related statutes [including the Endangered Species Act of 1973 (ESA)] for the proposed project. The Agencies issued a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) dated April 9, 2009, to which your office responded in a letter dated May 13, 2009.

The purpose of this letter is to inform you of our intended approach to consultation under Section 7(a) of the ESA, and designate a non-federal agent for consultation. Your May 13, 2009, letter provided sufficient information on listed species in the proposed project counties to allow us to begin the preparation of a Biological Assessment (BA) and related activities. Per your letter, the following are the current Federally-listed species in the proposed project counties:

Mr. Pete Gober

Status	***Species/Listing Name***
E	Crane, whooping except where EXPN (*Grus americana*)
T	Plover, piping except Great Lakes watershed (*Charadrius melodus*)
E	Shiner, Topeka (*Notropis topeka (=tristis)*)
E	American Burying beetle (*Nicrophorus americanus*)

We request that you provide any updates or changes to this list, otherwise we will proceed with our analyses based on the four species listed. A project description was provided in the Agencies' April 9, 2009, letter and it has not changed since then.

RUS will be the lead agency for Section 7 consultation, with the assistance of Western and their EIS contractor. We wish to designate as our agent for consultation Mr. Patrick Golden of Heritage Environmental Consultants in Denver, Colorado. Mr. Golden can be reached at (303) 618-7910 or by email at pgolden@heritage-ec.com. Heritage will be preparing the BA under supervision and for final approval by the Agencies. We trust that Mr. Golden will be able to work with your office directly for any information or other needs as he prepares the BA.

If you have any questions or require additional information please contact Richard Fristik, Sr. Environmental Protection Specialist, RUS, Engineering and Environmental Staff at (202) 720-5093, or e-mail richard.fristik@wdc.usda.gov; or contact Ms. Misti Schriner, Biologist, Western at (720) 962-7239, or e-mail mschriner@wapa.gov.

Sincerely,

Mark S. Plank

MARK S. PLANK
Director
Engineering and Environmental Staff
Water and Environmental Programs
USDA, Rural Utilities Service

cc: EES file EES DRankin EES RFristik EES MPlank S/O SD

Ms. Liana Reilly
Western Area Power Administration
Corporate Services Office
P.O. Box 281213
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Ms. Misti K. Schriner
Western Area Power Administration
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Mr. Patrick Golden
Heritage Environmental Consultants
2870 Emporia Ct.
Denver, CO 80238

Mr. Kevin Solie
Basin Electric Power Cooperative
1717 East Interstate Ave
Bismarck, ND 58503

Draft: EES RFristik, (202) 720-5093, 10/6/09; final mw 10/7/09
Recall: s/wep/rfristik/PW_SD_1_S 7 initial letter

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

November 12, 2009

Mr. Mark Plank, Director
USDA Rural Utilities Service
Engineering and Environmental Staff
Water and Environmental Program
1400 Independence Avenue, S.W.
Washington, DC 20250-0700

Re: Proposed Prairie Winds SD1 Wind Energy Facility - Aurora, Brule, Jerauld, and Tripp Counties, South Dakota

Dear Mr. Plank:

This letter is in response to your request dated October 14, 2009, for an update of federally-listed species (originally provided in our May 13, 2009, letter to your agency and the Western Area Power Administration [Western]) that may occur in the proposed project area(s) of the above referenced Prairie Winds SD1 Wind Energy Facility. It is our understanding that two sites are currently being evaluated for this facility: the Crow Lake site (Aurora/Jerauld/Brule Counties) and the Winner site (Tripp County).

We acknowledge your proposed approach to the section 7 consultation process with your agency, the U.S. Department of Agriculture- Rural Utilities Service (USDA-RUS), as the lead to be assisted by the Western/their Environmental Impact Statement contractor and the designation of Mr. Patrick Golden of Heritage Environmental Consultants in Denver, Colorado, as your agent for consultation purposes.

In accordance with section 7(c) of the Endangered Species Act (ESA), as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species may occur in the project area (this list is considered valid for 90 days):

Species	Status	Expected Occurrence
Whooping crane (Grus americana)	Endangered	Migration.
American burying beetle (Nicrophorus americanus)	Endangered	Resident, Tripp County.
Piping plover (Charadrius melodus)	Threatened	Migration, Nesting.
Topeka shiner (Notropis topeka)	Endangered	Resident, Waterways of Jerauld and Aurora Counties.

The detailed information for the above species provided in our May 13, 2009, letter remains pertinent.

If the USDA-RUS or their designated representative determines that the project "may adversely affect" listed species in South Dakota, it should request formal consultation from this office. If a “may affect - not likely to adversely affect” determination is made for this project, it should be submitted to this office for concurrence. If a "no effect" determination is made, further consultation may not be necessary. However, a copy of the determination should be sent to this office.

In addition to your consideration of the above federally listed species, please note that a substantial 90-day finding was recently issued by the U.S. Fish and Wildlife Service (Service) in response to a petition to list a species likely to occur within both of the potential Prairie Winds SD1 project sites: the northern leopard frog (Federal Register, Volume 74, No. 125, Wednesday, July 1, 2009, pages 31389-31401). The positive 90-day finding for the northern leopard frog does not afford it any level of protection under the ESA; however, a status review (12-month finding) is currently underway wherein the Service will determine whether listing of the western portion of the northern leopard frog’s population - west of the Mississippi River/Great Lakes Region - is warranted. The conclusion of the status review will be either a) the species does not warrant listing (i.e., no further action will be taken), or b) the species is warranted for ESA protection (i.e., it becomes a candidate species and may be proposed for listing immediately or sometime in the future). We recommend that you remain vigilant for the changing status of the northern leopard frog and consider the development and implementation of proactive measures to conserve northern leopard frog individuals and populations during all phases and activities associated with the proposed Prairie Winds SD1 Wind Energy Facility. You may contact Natalie Gates of this office at (605) 224-8693, Extension 234, for updates of the northern leopard frog’s status and/or view pertinent information the following website: http://www.fws.gov/southwest/es/Arizona/Northern_Frog.htm.

Please note that the bald eagle (Haliaeetus leucocephalus) occurs throughout South Dakota in all seasons, and new nests are appearing each year. While ESA protections for the bald eagle have been removed, effective August 8, 2007, the species will continue to be protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act. These laws protect bald eagles from a variety of harmful actions and impacts. Our agency has developed guidance for the public regarding means to avoid take of the bald eagle under these laws. The *"National Bald Eagle Management Guidelines"* are available online at: http://www.fws.gov/migratorybirds/baldeagle.htm. We recommend reviewing these guidelines as they serve to advise of circumstances where these laws may apply and to assist in avoiding potential violations on this and future projects.

While most species of migratory birds do not receive ESA protections, they are protected by the MBTA and are trust resources of the Service. As indicated in our May 13, 2009, letter submitted to the USDA-RUS and the Western, recent avian surveys in central South Dakota have detected species included in our *"Birds of Conservation Concern 2008"* publication; these species likely occur on both of the proposed sites for the Prairie Winds SD1 Wind Energy Facility based on known habitats occurring in these areas. The establishment of turbines in avian habitats has the potential to negatively affect migratory birds; thus, we continue to recommend avoidance, minimization, and finally, offsetting measures which may be outlined in an Avian and Bat Protection Plan or a separate plan designed to reduce any unavoidable detrimental effects to species protected by the MBTA. Particularly when turbine placement must occur within grasslands, we strongly recommend development of mitigative/offsetting measures for this habitat and its associated wildlife.

The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed as a result of this project even if all reasonable measures to protect them are used. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to minimize their impacts on migratory birds and by encouraging others to enact such programs. It is not possible to absolve individuals, companies, or agencies from liability even if they implement avian mortality avoidance or similar conservation measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without regard for their actions or without following an agreement to avoid take.

The Service has developed an online reporting system for avian mortalities. Instructions for our *"Bird Fatality/Injury Reporting Program"* may be found online at: http://www.aplic.org/USFWS_BirdFatality_FilerInstructions.pdf, and the reporting site itself is located online at: https://birdreport.fws.gov/. Migratory bird mortalities or injuries located by your company, by contractors, or other individuals should be recorded to this online site within 30 days of discovery. This reporting system may be used to compliment an Avian and Bat Protection Plan.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments. If you have any questions on these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 234.

Sincerely,

for Pete Gober
Field Supervisor
South Dakota Field Office

cc: Western; Lakewood, CO
(Attention: Misti Schriner)
Heritage Environmental Consultants; Denver, CO
(Attention: Patrick Golden)

Table C-1 Wildlife Species Observed in the Crow Lake Alternative (2008-2009 Field Surveys)

Common Name	Scientific Name	Common Name	Scientific Name
Birds			
Cooper's Hawk	*Accipiter cooperii*	Northern Bobwhite	*Colinus virginianus*
Western Grebe	*Aechmophorus occidentalis*	Rock Pigeon	*Columba livia*
Red-winged Blackbird	*Agelaius phoeniceus*	Eastern Wood Pewee	*Contopus virens*
Grasshopper Sparrow	*Ammodramus savannarum*	American Crow	*Corvus brachyrhynchos*
Northern Pintail	*Anas acuta*	Yellow Warbler	*Dendroica petechia*
American Widgeon	*Anas Americana*	Bobolink	*Dolichonyx oryzivorus*
Green-winged Teal	*Anas carolinensis*	Little Blue Heron	*Egretta caerulea*
Northern Shoveler	*Anas clypeata*	Horned Lark	*Eremophila alpestris*
Cinnamon Teal	*Anas cyanoptera*	Brewer's Blackbird	*Euphagus cyanocephalus*
Blue-winged Teal	*Anas discors*	Prairie Falcon	*Falco mexicanus*
Mallard	*Anas platyrhynchos*	American Kestrel	*Falco sparverius*
Gadwall	*Anas strepera*	American Coot	*Fulica americana*
Great Blue Heron	*Ardea herodias*	Common Snipe	*Gallinago gallinago*
Redhead	*Aythya Americana*	Common Loon	*Gavia immer*
Ring-necked Duck	*Aythya collaris*	Common Yellowthroat	*Geothlypis trichas*
Greater Scaup	*Aythya marila*	Sandhill Crane	*Grus canadensis*
Canvasback	*Aythya valisineria*	Barn Swallow	*Hirundo rustica*
Upland Sandpiper	*Bartramia longicauda*	Baltimore Oriole	*Icterus galbula*
Canada Goose	*Branta canadensis*	Orchard Oriole	*Icterus spurius*
Snowy Owl	*Bubo scandiacus*	Loggerhead Shrike	*Lanius ludovicianus*
Great horned Owl	*Bubo virginianus*	California Gull	*Larus californicus*
Cattle Egret	*Bubulcus ibis*	Ring-billed Gull	*Larus delawarensis*
Bufflehead	*Bucephala albeola*	Franklin's Gull	*Larus pipixcan*
Red-tailed Hawk	*Buteo jamaicensis*	Marbled Godwit	*Limosa fedoa*
Broad-winged Hawk	*Buteo platypterus*	Red-headed Woodpecker	*Melanerpes erythrocephalus*
Swainson's Hawk	*Buteo swainsoni*	Song Sparrow	*Melospiza melodia*
McCown's Longspur	*Calcarius mccownii*	Common Merganser	*Mergus merganser*
Chestnut-collared Longspur	*Calcarius ornatus*	Brown-headed Cowbird	*Molothrus ater*
White-rumped Dandpiper	*Calidris fuscicollis*	Black-crowned Night-Heron	*Nycticorax nycticorax*
American Goldfinch	*Carduelis tristis*	Ruddy Duck	*Oxyura jamaicensis*
Willet	*Catoptrophorus semipalmatus*	House Sparrow	*Passer domesticus*
Chimney Swift	*Chaetura pelagica*	Savannah Sparrow	*Passerculus sandwichensis*
Killdeer	*Charadrius vociferous*	American White Pelican	*Pelecanus erythrorhynchos*
Snow Goose	*Chen caerulescens*	Cliff Swallow	*Petrochelidon pyrrhonota*
Common Nighthawk	*Chordeiles minor*	Double-crested Cormorant	*Phalacrocorax auritus*
Northern Harrier	*Circus cyaneus*	Ring-necked Pheasant	*Phasianus colchicus*
Marsh Wren	*Cistothorus palustris*	Black-capped Chickadee	*Poecile atricapillus*

Table C-1 Wildlife Species Observed in the Crow Lake Alternative (2008-2009 Field Surveys)

Common Name	Scientific Name	Common Name	Scientific Name
Northern Flicker	*Colaptes auratus*	Vesper Sparrow	*Pooecetes gramineus*
Bobwhite Quail	*Colinus virginianus*	Great-tailed Grackle	*Quiscalus mexicanus*
Bank Swallow	*Riparia riparia*	Common Grackle	*Quiscalus quiscula*
Dickcissel	*Spiza americana*	Greater Yellowlegs	*Tringa melanoleuca*
Clay Colored Sparrow	*Spizella pallida*	Solitary Sandpiper	*Tringa solitaria*
Chipping Sparrow	*Spizella passerine*	House Wren	*Troglodytes aedon*
Field Sparrow	*Spizella pusilla*	American Robin	*Turdus migratorius*
N. Rough-wingedSwallow	*Stelgidopteryx serripennis*	Greater Prairie-Chicken	*Tympanuchus cupido*
Forster's Tern	*Sterna forsteri*	Sharp-tailed Grouse	*Tympanuchus phasianellus*
Western Meadowlark	*Sturnella neglecta*	Eastern Kingbird	*Tyrannus tyrannus*
European Starling	*Sturnus vulgaris*	Western Kingbird	*Tyrannus verticalis*
Tree Swallow	*Tachycineta bicolor*	Yellow-headed Blackbird	Xanthocephalus xanthocephalus
Brown Thrasher	*Toxostoma rufum*	Mourning Dove	*Zenaida macroura*
Mammals			
Coyote	*Canis latrans*	White-tailed Deer	*Odocoileus virginianus*
Black-tailed Prairie Dog	*Cynomys ludovicianus*	Fox Squirrel	*Sciurus niger*
White-tailed Jackrabbit	*Lepus townsendii*	ThirteenLine Ground Squirrel	*Spermophilus tridecemlineatus*
Striped Skunk	*Mephitis mephitis*	Cottontail Rabbit	*Sylvilagus floridanus*
Mink	*Mustela vison*	Eastern Cottontail Rabbit	*Sylvilagus floridanus*
Mule Deer	*Odocoileus hemionus*	Badger	*Taxidea taxus*
Amphibians			
Spring Peeper	*Pseudacris crucifer*		

Table C-2 Summary of individuals and group observations for fixed-point bird use surveys at the PrairieWinds SD1 Crow Lake Wind Resource Area, March 19 – May 27, 2009

Species	Scientific Name	Spring	
		# grps	# obs
Waterbirds		**29**	**176**
American White Pelican	*Pelecanus erythrorhyncos*	2	49
Black-crowned Night-Heron	*Nycticorax nycticorax*	1	4
Double-crested Cormorant	*Phalacrocorax auritus*	2	40
Forster's Tern	*Sterna forsteri*	1	1
Franklin's Gull	*Larus pipixcan*	6	25
ring-billed Gull	*Larus delawarensis*	12	30
Sandhill Crane	*Grus canadensis*	3	24
unidentified gull		2	3
Waterfowl		**155**	**1,053**
Blue-winged Teal	*Anas discors*	9	29
Canada Goose	*Branta canadensis*	20	666
Gadwall	*Anas strepera*	4	9
Green-winged Teal	*Anas crecca*	1	2
Mallard	*Anas platyrhynchos*	86	213
Northern Pintail	*Anas acuta*	23	55
Northern Shoveler	*Anas clypeata*	8	24
Ring-necked Duck	*Aythya collaris*	1	1
Snow Goose	*Chen caerulescens*	1	50
unidentified duck		2	4
Shorebirds		**87**	**96**
Common Snipe	*Gallinago gallinago*	1	1
Killdeer	*Charadrius vociferous*	64	69
Marbled Godwit	*Limosa fedoa*	9	12
Upland Dandpiper	*Bartramia longicauda*	13	14
Rails/Coots		**1**	**2**
American Coot	*Fulica americana*	1	2
Raptors		**56**	**58**
American Kestrel	*Falco sparverius*	5	5
Broad-winged Hawk	*Buteo platypterus*	3	3
Cooper's Hawk	*Accipiter cooperii*	1	1
Great Horned Owl	*Bubo virginianus*	1	1
Northern Harrier	*Circus cyaneus*	22	22
Prairie Falcon	*Falco mexicanus*	1	1
Red-tailed Hawk	*Buteo jamaicensis*	11	11
Swainson's Hawk	*Buteo swainsoni*	6	7
unidentified buteo		6	7
Upland Gamebirds		**162**	**180**
Greater Prairie-Chicken	*Tympanuchus cupido*	4	5
Ring-necked Pheasant	*Phasianus colchicus*	156	173
Dharp-tailed Grouse	*Tympanuchus phasianellus*	2	2
Doves/Pigeons		**47**	**62**
Mourning Dove	*Zenaida macroura*	47	62
Large Corvids		**2**	**2**
American Crow	*Corvus brachyrhynchos*	2	2
Passerines		**321**	**533**
American Goldfinch	*Carduelis tristis*	1	2
American Robin	*Turdus migratorius*	4	6
Baltimore Oriole	*Icterus galbula*	2	2
Barn Swallow	*Hirundo rustica*	13	21
Bobolink	*Dolichonyx oryzivorus*	8	9
Brown-headed Cowbird	*Molothrus ater*	24	44

Table C-2 Summary of individuals and group observations for fixed-point bird use surveys at the PrairieWinds SD1 Crow Lake Wind Resource Area, March 19 – May 27, 2009

Species	Scientific Name	Spring	
		# grps	# obs
Chipping Sparrow	*Spizella passerine*	1	1
Cliff Swallow	*Petrochelidon pyrrhonota*	2	5
Common Grackle	*Quiscalus quiscula*	7	17
Dickcissel	*Spiza Americana*	2	2
Eastern Kingbird	*Tyrannus tyrannus*	2	2
European Starling	*Sturnus vulgaris*	3	8
Horned Lark	*Eremophila alpestris*	25	56
Loggerhead Shrike	*Lanius ludovicianus*	1	1
Orchard Oriole	*Icterus spurious*	1	1
Red-winged Blackbird	*Agelaius phoeniceus*	62	184
Savannah Sparrow	*Passerculus sandwichensis*	5	5
Song Sparrow	*Melospiza melodia*	1	1
Tree Swallow	*Tachycineta bicolor*	2	2
unidentified sparrow		1	3
unidentified swallow		1	2
Western Kingbird	*Tyrannus verticalis*	1	1
Western Meadowlark	*Sturnella neglecta*	150	156
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	1	1
Yellow Warbler	*Dendroica petechia*	1	1
Other Birds		**14**	**15**
Common Nighthawk	*Chordeiles minor*	4	4
Northern Flicker	*Colaptes auratus*	9	10
unidentified woodpecker		1	1
Unidentified Birds		**1**	**1**
unidentified bird		1	1
Overall		**875**	**2,178**

Table C-3 Total number of groups and individuals for each bird type and species observed during transect bird use surveys at the PrairieWinds SD1 Crow Lake Wind Resource Area, June 2 – July 7, 2009

Species/Type	Scientific Name	# grps	# obs
Waterbirds		**8**	**12**
Double-crested Cormorant	*Phalacrocorax auritus*	3	7
Forster's Tern	*Sterna forsteri*	1	1
Great Blue Heron	*Ardea herodias*	2	2
unidentified tern		2	2
Waterfowl		**43**	**128**
Blue-winged Teal	*Anas discors*	8	20
Canada Goose	*Branta canadensis*	1	5
Gadwall	*Anas strepera*	1	1
Mallard	*Anas platyrhynchos*	15	44
Northern Pintail	*Anas acuta*	5	10
Northern Shoveler	*Anas clypeata*	2	10
Redhead	*Aythya Americana*	1	1
Ring-necked Duck	*Aythya collaris*	1	1
unidentified Duck		9	36
Shorebirds		**71**	**93**
Common Snipe	*Gallinago gallinago*	3	3
Killdeer	*Charadrius vociferous*	21	24
Marbled Godwit	*Limosa fedoa*	5	6
unidentified sandpiper		1	1
UplandSandpiper	*Bartramia longicauda*	40	58
Willet	*Catoptrophorus semipalmatus*	1	1
Rails/Coots		**1**	**1**
American Coot	*Fulica americana*	1	1
Raptors		**12**	**12**
Northern Harrier		*11*	*11*
Northern Harrier	*Circus cyaneus*	11	11
Owls		*1*	*1*
Great Horned Owl	*Bubo virginianus*	1	1
Upland Gamebirds		**86**	**118**
Greater Prairie-Chicken	*Tympanuchus cupido*	12	23
Ring-neckedPheasant	*Phasianus colchicus*	72	93
Sharp-tailed Grouse	*Tympanuchus phasianellus*	2	2
Doves/Pigeons		**26**	**41**
Mourning Dove	*Zenaida macroura*	25	38
Tock Pigeon	*Columba livia*	1	3
Passerines		**1,636**	**2,417**
Passerines		*9*	*11*
unidentified passerine		9	11
Blackbirds/Orioles		*910*	*1,509*
Brown-headed Cowbird	*Molothrus ater*	273	544
Bobolink	*Dolichonyx oryzivorus*	70	83
Brewer's Blackbird	*Euphagus cyanocephalus*	1	1
Common Grackle	*Quiscalus quiscula*	23	37
European Starling	*Sturnus vulgaris*	2	36
Great-tailed Grackle	*Quiscalus mexicanus*	3	3
Orchard Oriole	*Icterus spurious*	1	1
Red-winged Blackbird	*Agelaius phoeniceus*	120	225
Western Meadowlark	*Sturnella neglecta*	396	535
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	21	44
Finches		*6*	*7*

Table C-3 Total number of groups and individuals for each bird type and species observed during transect bird use surveys at the PrairieWinds SD1 Crow Lake Wind Resource Area, June 2 – July 7, 2009

Species/Type	Scientific Name	# grps	# obs
American Goldfinch	*Carduelis tristis*	6	7
Flycatchers		*42*	*54*
Eastern Kingbird	*Tyrannus tyrannus*	32	41
Western Kingbird	*Tyrannus verticalis*	10	13
Grassland/Sparrows		*585*	*669*
Chestnut-collared Longspur	*Calcarius ornatus*	70	83
Clay-colored Sparrow	*Spizella pallid*	12	13
Chipping Sparrow	*Spizella passerine*	16	17
Dickcissel	*Spiza Americana*	23	26
Field Sparrow	*Spizella pusilla*	8	8
Grasshopper Sparrow	*Ammodramus savannarum*	282	340
Horned Lark	*Eremophila alpestris*	2	2
McCown's Longspur	*Calcarius mccownii*	1	1
Savannah Sparrow	*Passerculus sandwichensis*	123	123
Song Sparrow	*Melospiza melodia*	1	2
unidentified sparrow		43	50
Vesper Sparrow	*Pooecetes gramineus*	4	4
Swallows		*75*	*158*
Bank Swallow	*Riparia riparia*	10	12
Barn Swallow	*Hirundo rustica*	55	128
Cliff Swallow	*Petrochelidon pyrrhonota*	5	8
N. Rough-winged Swallow	*Stelgidopteryx serripennis*	2	5
unidentified swallow		3	5
Thrushes		*4*	*4*
American Robin	*Turdus migratorius*	3	3
unidentified bluebird		1	1
Warblers		*3*	*3*
Common Yellowthroat	*Geothlypis trichas*	1	1
Yellow Warbler	*Dendroica petechia*	2	2
Wrens		*2*	*2*
House Wren	*Troglodytes aedon*	1	1
Marsh Wren	*Cistothorus palustris*	1	1
Other Birds		**1**	**1**
Woodpeckers		*1*	*1*
Northern Flicker	*Colaptes auratus*	1	1
Unidentified Birds		**1**	**1**
unidentified bird		1	1
Overall		**1,885**	**2,824**

Table C-4 Wildlife Species Observed in the Winner Alternative (2008-2009 Field Surveys)

Common Name	Scientific Name	Common Name	Scientific Name
Birds			
Cooper's Hawk	*Accipiter cooperii*	Common snipe	*Gallinago gallinago*
Red-winged Blackbird	*Agelaius phoeniceus*	Common yellowthroat	*Geothlypis trichas*
Wood Duck	*Aix sponsa*	Sandhill crane	*Grus canadensis*
GrasshopperDparrow	*Ammodramus savannarum*	Bald eagle	*Haliaeetus leucocephalus*
Northern Pintail	*Anas acuta*	Barn swallow	*Hirundo rustica*
American Widgeon	*Anas Americana*	Orchard oriole	*Icterus spurius*
Green-winged Teal	*Anas carolinensis*	Dark-eyed junco	*Junco hyemalis*
Northern Shoveler	*Anas clypeata*	Northern shrike	*Lanius excubitor*
Blue-winged Teal	*Anas discors*	Loggerhead shrike	*Lanius ludovicianus*
Mallard	*Anas platyrhynchos*	Marbled godwit	*Limosa fedoa*
Teal species	*Anas spp*	Red-headed woodpecker	*Melanerpes erythrocephalus*
Gadwall	*Anas strepera*	Wild turkey	*Meleagris gallopavo*
Great Blue Heron	*Ardea herodias*	Song sparrow	*Melospiza melodia*
Burrowing Owl	*Athene cunicularia*	Black-and-white warbler	*Mniotilta varia*
Lesser Scaup	*Aythya affinis*	Brown-headed cowbird	*Molothrus ater*
Ring-necked Duck	*Aythya collaris*	Ruddy duck	*Oxyura jamaicensis*
Greater Scaup	*Aythya marila*	Osprey	*Pandion haliaetus*
Canvasback	*Aythya valisineria*	Savannah sparrow	*Passerculus sandwichensis*
Upland Sandpiper	*Bartramia longicauda*	American white pelican	*Pelecanus erythrorhynchos*
Canada Goose	*Branta canadensis*	Cliff swallow	*Petrochelidon pyrrhonota*
Great horned Owl	*Bubo virginianus*	Double-crested cormorant	*Phalacrocorax auritus*
Cattle Egret	*Bubulcus ibis*	Wilson's phalarope	*Phalaropus tricolor*
Bufflehead	*Bucephala albeola*	Ring-necked pheasant	*Phasianus colchicus*
Red-tailed Hawk	*Buteo jamaicensis*	Downy woodpecker	*Picoides pubescens*
Rough-legged Hawk	*Buteo lagopus*	Pied-billed grebe	*Podilymbus podiceps*
Ferruginous Hawk	*Buteo regalis*	Black-capped chickadee	*Poecile atricapillus*
Swainson's Hawk	*Buteo swainsoni*	Common grackle	*Quiscalus quiscula*
Chestnut-collared Longspur	*Calcarius ornatus*	Bank swallow	*Riparia riparia*
American Goldfinch	*Carduelis tristis*	Eastern bluebird	*Sialia sialis*
Turkey Vulture	*Cathartes aura*	White-breasted nuthatch	*Sitta carolinenis*
Belted Kingfisher	*Ceryle alcyon*	Dickcissel	*Spiza americana*
Killdeer	*Charadrius vociferous*	Clay-colored sparrow	*Spizella pallida*
Lark Fparrow	*Chondestes grammacus*	Chipping sparrow	*Spizella passerine*
Common Nighthawk	*Chordeiles minor*	Field sparrow	*Spizella pusilla*
Northern Harrier	*Circus cyaneus*	N. rough-winged swallow	*Stelgidopteryx serripennis*
Northern Flicker	*Colaptes auratus*	Western meadowlark	*Sturnella neglecta*
Northern Bobwhite	*Colinus virginianus*	European starling	*Sturnus vulgaris*
Rock Dove	*Columba livia*	Starling	*Sturnus vulgaris*
American Crow	*Corvus brachyrhynchos*	Tree swallow	*Tachycineta bicolor*
Blue Jay	*Cyanocitta cristata*	Brown thrasher	*Toxostoma rufum*

Table C-4 Wildlife Species Observed in the Winner Alternative (2008-2009 Field Surveys)

Common Name	Scientific Name	Common Name	Scientific Name
Tundra Swan	*Cygnus columbianus*	Lesser yellowlegs	*Tringa flavipes*
Bell's Vireo	*Dendroica castanea*	House wren	*Troglodytes aedon*
Yellow-rumped Warbler	*Dendroica coronata*	American robin	*Turdus migratorius*
Yellow Warbler	*Dendroica petechia*	Greater prairie-chicken	*Tympanuchus cupido*
Bobolink	*Dolichonyx oryzivorus*	Sharp-tailed grouse	*Tympanuchus phasianellus*
Horned Lark	*Eremophila alpestris*	Eastern kingbird	*Tyrannus tyrannus*
Prairie Falcon	*Falco mexicanus*	Western kingbird	*Tyrannus verticalis*
American Kestrel	*Falco sparverius*	Yellow-headed blackbird	Xanthocephalus xanthocephalus
American Coot	*Fulica americana*	Mourning dove	*Zenaida macroura*
Mammals			
Black-tailed prairie dog	*Cynomys ludovicianus*	White-tailed deer	*Odocoileus virginianus*
Opossum	*Didelphis virginiana*	Muskrat	*Ondatra zibethicus*
Pocket gopher	*Geomys bursarius*	Raccoon	*Procyon lotor*
White-tailed jackrabbit	*Lepus townsendii*	Cottontail rabbit	*Sylvilagus floridanus*
Striped skunk	*Mephitis mephitis*	Badger	*Taxidea taxus*
Mule deer	*Odocoileus hemionus*	Red fox	*Vulpes vulpes*
Reptiles and Amphibians			
Painted turtle	*Chrysemys picta*	Spring peeper	*Pseudacris crucifer*
Bull snake	*Pituophis catenifer sayi*	Northern leopard frog	*Rana pipiens*

Table C-5 Summary of individual and group observations for fixed-point use surveys at the PrairieWinds SD1 Winner Wind Resource Area, April 6 – May 26, 2009.

Species	Scientific Name	Spring	
		# grps	# obs
Waterbirds		**8**	**115**
American White Pelican	*Pelecanus erythrorhyncos*	1	2
Cattle Egret	*Bubulcus ibis*	1	1
Double-crested Cormorant	*Phalacrocorax auritus*	3	109
Great blue Heron	*Ardea herodias*	2	2
Sandhill Crane	*Grus canadensis*	1	1
Waterfowl		**50**	**90**
Blue-winged Teal	*Anas discors*	5	10
Canada Goose	*Branta canadensis*	7	11
Gadwall	*Anas strepera*	1	2
Lesser Scaup	*Aythya affinis*	1	2
Mallard	*Anas platyrhynchos*	29	52
Northern Pintail	*Anas acuta*	3	4
Northern Shoveler	*Anas clypeata*	1	1
Ring-necked Duck	*Aythya collaris*	1	4
unidentified duck		1	3
Wood Duck	*Aix sponsa*	1	1
Shorebirds		**71**	**75**
Common Snipe	*Gallinago gallinago*	11	11
Killdeer	*Charadrius vociferus*	24	24
Lesser Yellowlegs	*Tringa flavipes*	3	7
Marbled Godwit	*Limosa fedoa*	1	1
Upland Sandpiper	*Bartramia longicauda*	32	32
Raptors		**27**	**30**
American Kestrel	*Falco sparverius*	4	5
Ferruginous Hawk	*Buteo regalis*	1	1
Great horned Owl	*Bubo virginianus*	1	1
Northern Harrier	*Circus cyaneus*	7	7
Red-tailed Hawk	*Buteo jamaicensis*	4	4
Rough-legged Hawk	*Buteo lagopus*	1	2
Swainson's Hawk	*Buteo swainsoni*	4	4
unidentified buteo		5	6
Vultures		**7**	**12**
turkey vulture	*Cathartes aura*	7	12
Upland Gamebirds		**131**	**230**
Greater Prairie-Chicken	*Tympanuchus cupido*	7	35
Ring-necked Pheasant	*Phasianus colchicus*	112	132
Sharp-tailed Grouse	*Tympanuchus phasianellus*	3	6
Wild urkey	*Meleagris gallopavo*	9	57
Doves/Pigeons		**55**	**78**
Mourning Dove	*Zenaida macroura*	54	76
Rock Pigeon	*Columba livia*	1	2
Large Corvids		**11**	**13**
American Crow	*Corvus brachyrhynchos*	11	13
Passerines		**315**	**552**
American Tobin	*Turdus migratorius*	22	24
Baltimore Oriole	*Icterus galbula*	3	3
Barn Swallow	*Hirundo rustica*	4	4
Blue Jay	*Cyanocitta cristata*	2	2

Table C-5 Summary of individual and group observations for fixed-point use surveys at the PrairieWinds SD1 Winner Wind Resource Area, April 6 – May 26, 2009.

Species	Scientific Name	Spring	
		# grps	# obs
Bobolink	*Dolichonyx oryzivorus*	4	5
Brown-headed Cowbird	*Molothrus ater*	15	30
Chipping Sparrow	*Spizella passerina*	2	25
Cliff Swallow	*Petrochelidon pyrrhonota*	1	5
Common Grackle	*Quiscalus quiscula*	16	43
Dark-eyed Junco	*Junco hyemalis*	2	5
Eastern Bluebird	*Sialia sialis*	2	2
Eastern Kingbird	*Tyrannus tyrannus*	4	6
European Starling	*Sturnus vulgaris*	9	23
Horned Lark	*Eremophila alpestris*	6	6
Loggerhead Shrike	*Lanius ludovicianus*	2	3
Red-winged Blackbird	*Agelaius phoeniceus*	59	199
Savannah Sparrow	*Passerculus sandwichensis*	2	2
Song Sparrow	*Melospiza melodia*	1	1
Western Kingbird	*Tyrannus verticalis*	1	1
Western Meadowlark	*Sturnella neglecta*	157	162
Yellow-rumped Warbler	*Dendroica coronata*	1	1
Other Birds		**28**	**28**
Downy Woodpecker	*Picoides pubescens*	1	1
Northern Flicker	*Colaptes auratus*	23	23
Ted-headed Woodpecker	*Melanerpes erythrocephalus*	1	1
unidentified woodpecker		3	3
Overall		**703**	**1,223**

Table C-6 Total number of groups and individuals for each bird type and species observed during breeding bird transect surveys at the PrairieWinds SD1 Winner Wind Resource Area, June 12 – July 10, 2009

Species/Type	Scientific Name	# grps	# obs
Waterbirds		**14**	**14**
Great Blue Heron	*Ardea herodias*	14	14
Waterfowl		**21**	**50**
Blue-winged Teal	*Anas discors*	2	11
Canvasback	*Aythya valisineria*	1	1
Mallard	*Anas platyrhynchos*	18	38
Shorebirds		**192**	**225**
Common Snipe	*Gallinago gallinago*	18	18
Killdeer	*Charadrius vociferus*	36	46
Upland Sandpiper	*Bartramia longicauda*	135	156
Wilson's Phalarope	*Phalaropus tricolor*	3	5
Raptors		**12**	**12**
Buteos		*9*	*9*
Red-tailed Hawk	*Buteo jamaicensis*	7	7
unidentified buteo		2	2
Falcons		*1*	*1*
Prairie Falcon	*Falco mexicanus*	1	1
Owls		*1*	*1*
Great Horned Owl	*Bubo virginianus*	1	1
Other Raptors		*1*	*1*
unidentified raptor		1	1
Upland Gamebirds		**30**	**34**
Greater Prairie-Chicken	*Tympanuchus cupido*	3	6
Northern Bobwhite	*Colinus virginianus*	1	1
Ring-necked Pheasant	*Phasianus colchicus*	24	25
Sharp-tailed Grouse	*Tympanuchus phasianellus*	1	1
Wild Turkey	*Meleagris gallopavo*	1	1
Doves/Pigeons		**69**	**92**
Mourning Dove	*Zenaida macroura*	69	92
Passerines		**1,390**	**1,787**
Blackbirds/Orioles		*736*	*1,096*
Brown-headed Cowbird	*Molothrus ater*	73	134
Bobolink	*Dolichonyx oryzivorus*	115	139
Common Grackle	*Quiscalus quiscula*	11	99
Orchard Oriole	*Icterus spurius*	1	1
Red-winged Blackbird	*Agelaius phoeniceus*	116	262
Western Meadowlark	*Sturnella neglecta*	417	456
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	3	5
Creepers/Nuthatches		*1*	*1*
White-breasted Nuthatch	*Sitta carolinenis*	1	1
Finches		*5*	*5*
American Goldfinch	*Carduelis tristis*	5	5
Flycatchers		*13*	*14*
Eastern Kingbird	*Tyrannus tyrannus*	7	8
Western Kingbird	*Tyrannus verticalis*	6	6
Grassland/Sparrows		*570*	*578*
Chestnut-collared Longspur	*Calcarius ornatus*	11	12
Dickcissel	*Spiza americana*	108	109
Field Sparrow	*Spizella pusilla*	5	5

Table C-6 Total number of groups and individuals for each bird type and species observed during breeding bird transect surveys at the PrairieWinds SD1 Winner Wind Resource Area, June 12 – July 10, 2009

Species/Type	Scientific Name	# grps	# obs
Grasshopper Sparrow	*Ammodramus savannarum*	58	58
Horned Lark	*Eremophila alpestris*	6	10
Lark Sparrow	*Chondestes grammacus*	2	2
Savannah Sparrow	*Passerculus sandwichensis*	361	361
unidentified sparrow		19	21
Mimids		*1*	*1*
BrownThrasher	*Toxostoma rufum*	1	1
Swallows		*42*	*70*
Bank Swallow	*Riparia riparia*	1	1
Barn Swallow	*Hirundo rustica*	17	22
Cliff Swallow	*Petrochelidon pyrrhonota*	7	9
N. Rough-winged Swallow	*Stelgidopteryx serripennis*	1	4
Tree Swallow	*Tachycineta bicolor*	13	29
unidentified swallow		3	5
Thrushes		*7*	*7*
American Robin	*Turdus migratorius*	2	2
unidentified bluebird		5	5
Titmice/Chickadees		*1*	*1*
Black-capped Chickadee	*Poecile atricapillus*	1	1
Vireos		*2*	*2*
Bell's Vireo	*Dendroica castanea*	2	2
Warblers		*8*	*8*
Black-and-white Warbler	*Mniotilta varia*	1	1
CommonYellowthroat	*Geothlypis trichas*	3	3
Yellow Warbler	*Dendroica petechia*	*4*	4
Wrens		*1*	*1*
House Wren	*Troglodytes aedon*	1	1
Corvids		*3*	*3*
American Crow	*Corvus brachyrhynchos*	3	3
Other Birds		**16**	**18**
Woodpeckers		*9*	*11*
Northern Flicker	*Colaptes auratus*	7	9
Red-headed Woodpecker	*Melanerpes erythrocephalus*	1	1
unidentified woodpecker		1	1
Other Birds		*7*	*7*
Common Nighthawk	*Chordeiles minor*	7	7
Overall		**1,744**	**2,232**

Appendix D

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Appendix D

Cultural Resources

- Prehistoric Background/Information for the Proposed Project alternatives
- Rosebud correspondence dated September 3, 2009

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Prehistoric Periods

Information pertaining to both Proposed Project site alternatives has been compiled in this section to provide one discussion pertaining to the Prehistoric Period of the regional area. The two site alternatives are within the Great Plains Cultural Area, specifically between the Prairie Culture Area and Plains Culture Area according to Kroeber (1939) and Driver and Massey (1957). The Prairie Culture Area is approximately east of the Missouri River and the Plains Culture Area approximately west of the Missouri River. There are many similarities between the Prairie and Plains cultures, the most significant being hunting and use of bison. Some of the major differences between the two culture areas seen archaeologically are based on settlement patterns. The Plains Tribes resided year-round in tepees and were primarily nomadic, moving across the land, while the Prairie Tribes resided in permanent villages year-round, practiced horticulture, and used tepees when away hunting.

Not much is known about the cultural history of the Paleoindian Tradition in the United States because the Paleoindian Tradition is primarily based on a material culture. Material culture includes cultural remains, such as stone tools, ceramic pots, or ornaments that indicate the material expression of a people. Until very recently (late 2007) the Bering Strait "multiple waves" migration hypothesis put modern Native American Tribes in North America anywhere between 17,500 to 6,000 years ago. There had not been any definitive evidence to link the Paleoindian Tradition occupants to the later inhabitants of the Great Plains area. However, recent DNA evidence has added support for a single migration and population of North and South America as early as 30,000 years ago (PLoS 2007). The following is the established chronology for the Central Plains based on the material culture.

The prehistoric period in South Dakota is divided into the Paleoindian Tradition, ca. 12,000 to 6,000 years before present (B.P.); Plains Archaic Tradition, ca. 6,000 to 3,000 B.P.; Plains Woodland Tradition, ca. 3,000 to 1,200 B.P.; and Plains Village Tradition, ca. 1,200 to 300 B.P.

The northern Plains Paleoindian environment was primarily upland grasslands (Yansa 2007) and ideal habitat for roaming animals such as the extinct mastodon, as well as the American bison. The Paleoindian Tradition (ca. 12,000 to 6,000 B.P.) is characterized by small, nomadic, highly mobile groups that followed game across the landscape. Small and medium-sized animals, fish, and plant resources also supplemented their diet. The Paleoindian Tradition is divided into two phases: Clovis and Folsom, which are based on projectile point types and assumed to reflect changes in hunting technologies, presumably in response to the changing climate that grew successively warmer and drier.

The Plains Archaic Tradition (ca. 6,000 to 3,000 B.P.) reflects different sets of lithic tool and projectile point typologies, as well as ground stone tools. Archaeological evidence of the Plains Archaic Tradition in the Central Plains area includes semi-subterranean pithouses, evidence of waddle and daub structures, side-notched projectile points, and an increase in and more formalized grinding implements. These are likely due to changes in subsistence and settlement patterns as a response to changing climatic conditions. Groups are now thought to have been more semi-nomadic and to have hunted and gathered in a seasonal pattern with a heavy reliance on communal bison hunts and plant resources.

The Plains Woodland Tradition (ca. 3,000 to 1,200 B.P.) is best seen along water sources. It is distinguished from previous traditions by the presence of ceramics, low circular or conical mounds that may or may not contain burials, and the development of horticultural practices. Bison, as well as a range of smaller mammals and fish, were a primary source of protein. Wild plants were gathered and during the Late Plains Woodland Tradition and corn was grown, as documented at the Arp Site 39BR101 and 39BR102. The practice of horticulture allowed for the establishment of permanent villages along water sources. Notable Plains Woodland village sites in central South Dakota include the La Roche Site (39ST9); the Arp Site (39BR101 and 39BR102); the Scalp Creek Site (39GR1); and White Swan Mound Site (39CH9).

The Plains Village Tradition (ca. 1,200 to 300 B.P.) is thought to be a Plains variation of the Mississippian custom from the central United States. This cultural pattern appeared in the Mississippi River Valley ca. 1,100 to 1,000 B.P. and consisted of sedentary villages, river bottom agriculture, flat-top burial mounds, triangular projectile points, and advanced ceramic designs and decorations. However, villages were already established in the Central Plains area, horticulture was already underway, mounds were being built, and ceramics were already being produced. Villages during the Plains Village Tradition were permanent and sometimes fortified. During the Late Plains Village Tradition, the Siouan-speaking people from the northern Minnesota area entered Arikara territory in southeastern South Dakota and the cultural tribal boundaries began to change.

The Historic Period

Information pertaining to both of the Proposed Project site alternatives has been compiled in this section to provide a discussion pertaining to the Historic Period of the regional area. Early contact between Europeans and Central Plains tribes ranged from 1540 to 1700 and included:

Francisco Vásquez de Coronado’s contact with the Plains tribes of west Texas and Kansas in 1540-1542

Active French voyageur-traders among the Pawnee before 1700 in the Central Plains

Explorers Pierre Esprit Radisson and Médard Chouart, sieur des Groseilliers’ contact with the Santee Sioux in 1659

Louis Jolliet and Jacques Marquette’s exploration of the Mississippi River in 1673

René-Robert Cavelier, sieur de la Salle’s exploration of the Mississippi River in 1682 with additional explorations past the mouth of the Missouri by 1700

This early contact period coincides with the demographic changes occurring in the Central Plains. When the Europeans first met the tribes in the Central Plains they encountered some who had been in the area for a very long time as well as others who had recently occupied the region. The Historic Period (ca. 300 B.P. to present) is marked by a great deal of cultural change on the Great Plains. The earlier migration of the Sioux people had an effect on the Arikara who had previously occupied the region. The Sioux Tribes were nomadic people who followed the bison, and the Plains were an ideal environment for them. With the influx of European influence and acquisition of horses from the southwestern tribes, the Sioux Tribes were able to cross the Missouri River in 1760 and claim the entire Plains north of the Arkansas River as their hunting grounds.

Greater American presence on the Plains came in the following century. The Lewis and Clark Expedition (1803–1806), headed by Meriwether Lewis and William Clark, was the first American overland expedition to the Pacific coast and back. As directed by President Thomas Jefferson in a letter to Lewis, the object of their mission was to explore the Missouri River, by its course and communication with the waters of the Pacific Ocean and determine whether the Columbia, Oregon, Colorado or any other river would offer the most direct and practicable water communication across the continent for the purposes of commerce.

During the 1800s Americans generally thought that the Great Plains was better off with the Indians and was worth little for agricultural use. When gold was discovered in California in the 1840s, Americans wanted a quicker passage west and it is estimated that 12,000 wagons traveled cross country to Oregon and California from 1834 to 1867. In 1862, President Abraham Lincoln signed the Homestead Act that allotted 160-acre parcels to settlers of undeveloped land outside of the original 13 colonies. This Act became a tool for redistribution of Indian lands and had a great effect on the reservation system on the Plains. Treaties were signed for the establishment of Indian reservations beginning in the late 1850s with Yankton (1858), Lake Traverse (1867), and the Great Sioux Reservation (1868). The Great Sioux Reservation set aside the land in South Dakota west of the Missouri River, which consisted of some 25 million acres. The reservations would later be Crow Creek and Old Winnebago, Cheyenne River, Lower Brulé, Pine Ridge, and Rosebud.

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Molly Cresto

Subject: FW: Prairie Winds Appendix

Importance: High

From: Rosebud Sioux Tribe [mailto:rstthpo@yahoo.com]
Sent: Thu 9/3/2009 6:36 AM
To: Mitchell, Trish
Subject: RE: PrairieWinds Project info

Good Morning Trish,
Mary finished the record search for the Winner site.There are no Traditional Cultural Properties recorded in our data base within the proposed project this does not perclude the possibility of a site of heritage importance being located by an archaeologist. This project may proceed as planned. If sites are located by this undertaking please notify my office as soon as possible. Thank you.
Kathe Arcoren

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