WHITE WIND FARM LLC
APPLICATION TO THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION FOR A FACILITY PERMIT

WHITE WIND FARM AND ASSOCIATED COLLECTION SUBSTATION AND ELECTRIC INTERCONNECTION SYSTEM

Prepared for

NAVITAS ENERGY

Prepared by

HDR Engineering Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

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SDPUC DOCKET NO. EL05-001

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COMPLETENESS CHECKLIST

The contents required for an application with the Public Utilities Commission of the State of South Dakota (PUC) are described in SDCL 49-1-8 and further clarified in ARSD 20:10:13:01(1) et seq. The Commission submittal requirements are listed in Table 1 with cross-references indicating where the information can be found in this Application.

TABLE 1
COMPLETENESS CHECKLIST

SDCL	ARSD	Required Information	Location
49-41B-11(1)	20:10:22:06	Names of participants required. The application shall contain the name, address, and telephone number of all persons participating in the proposed facility at the time of filing, as well as the names of any individuals authorized to receive communications relating to the application on behalf of those persons.	1.0
49-41B-11(7)	20:10:22:07	Name of owner and manager. The application shall contain a complete description of the current and proposed rights of ownership of the proposed facility. It shall also contain the name of the project manager of the proposed facility.	2.0
49-41B-11(8)	20:10:22:08	Purpose of facility. The applicant shall describe the purpose of the proposed facility.	3.0
49-41B-11(12)	20:10:22:09	Estimated cost of facility. The applicant shall describe the estimated construction cost of the proposed facility.	4.0
49-41B-11(9)	20:10:22:10	Demand for facility. The applicant shall provide a description of present and estimated consumer demand and estimated future energy needs of those customers to be directly served by the proposed facility. The applicant shall also provide data, data sources, assumptions, forecast methods or models, or other reasoning upon which the description is based. This statement shall also include information on the relative contribution to any power or energy distribution network or pool that the proposed facility is projected to supply and a statement on the consequences of delay or termination of the construction of the facility.	3.0
49-41 B-11	20:10:22:11	General site description. The application shall contain a general site description of the proposed facility including a description of the specific site and its location with respect to state, county, and other political subdivisions; a map showing prominent features such as cities, lakes and rivers; and maps showing cemeteries, places of historical significance, transportation facilities, or other public facilities adjacent to or abutting the plant or transmission site.	5.0

SDCL	ARSD	Required Information	Location
49-41B-11(6), 49-41B-21, 34A-9-7(4)	20:10:22:12	Alternative sites. The applicant shall present information related to its selection of the proposed site for the facility, including the following: (1) The general criteria used to select alternative sites, how these criteria were measured and weighed, and reasons for selecting these criteria; (2) An evaluation of alternative sites considered by the applicant for the facility; (3) An evaluation of the proposed plant or transmission site and its advantages over the other alternative sites considered by the applicant, including a discussion of the extent to which reliance upon eminent domain powers could be reduced by use of an alternative site, alternative generation method, or alternative waste handling method.	6.0
49-41B-11(11); 49-41B-21; 49-41B-22	20:10:22:13	Environmental information. The applicant shall provide a description of the existing environment at the time of the submission of the application, estimates of changes in the existing environment which are anticipated to result from construction and operation of the proposed facility, and identification of irreversible changes which are anticipated to remain beyond the operating lifetime of the facility. The environmental effects shall be calculated to reveal and assess demonstrated or suspected hazards to the health and welfare of human, plant, and animal communities which may be cumulative or synergistic consequences of siting the proposed facility in combination with any operating energy conversion facilities, existing or under construction. The applicant shall provide a list of other major industrial facilities under regulation which may have an adverse affect of the environment as a result of their construction or operation in the transmission site or siting area.	7.0
49-41B-11; 49-41B-22	20:10:22:14	Effect on physical environment. The applicant shall provide information describing the effect of the proposed facility on the physical environment. The information shall include: (1) A written description of the regional land forms surrounding the proposed plant site or through which the transmission facility would pass; (2) A topographic map of the transmission site or siting area; (3) A written summary of the geological features of the siting area or transmission site using the topographic map as a base showing the bedrock geology and surficial geology with sufficient cross-sections to	8.0, 9.0

SDCL	ARSD	Required Information	Location
		depict the major subsurface variations in the siting area; (4) A description and location of economic deposits such as lignite, sand and gravel, scoria, and industrial and ceramic quality clay existent within the plan or transmission site; (5) A description of the soil type at the plant site; (6) An analysis of potential erosion or sedimentation which may result from site clearing, construction, or operating activities and measures which would be taken for their control; (7) Information on areas of seismic risks, subsidence potential and slope instability for the siting area or transmission site; and (8) An analysis of any constraints that may be imposed by geological characteristics on the design, construction, or operation of the proposed facility and a description of plans to offset such constraints.	

SDCL	ARSD	Required Information	Location
49-41B-11; 49-41B-21; 49-41B-22	20:10:22:15	Hydrology. The applicant shall provide information concerning the hydrology in the area of the proposed plant or transmission site and the effect of the proposed site on surface and groundwater. The information shall include: (1) A map drawn to scale of the plant or transmission site showing surface water drainage patterns before and anticipated patterns after construction of the facility; (2) Using plans filed with any local, state, or Federal agencies, indication on a map drawn to scale of the current planned water uses by communities, agriculture, recreation, fish, and wildlife which may be affected by the location of the proposed facility and a summary of those effects; (3) A map drawn to scale locating any known surface or groundwater supplies within the siting area to be used as a water source or a direct water discharge site for the proposed facility and all offsite pipelines or channels required for water transmission; (4) If aquifers are to be used as a source of potable water supply or process water, specifications of the aquifers to be used and definition of their characteristics, including the capacity of the aquifer to yield water, the estimated recharge rate, and the quality of ground water; (5) A description of designs for storage, reprocessing, and cooling prior to discharge of heated water entering natural drainage systems; (6) If deep well injection is to be used for effluent disposal, a description of the reservoir storage capacity, rate of injection, and confinement characteristics and potential negative effects on any aquifers and groundwater users which may be affected.	9.0

SDCL	ARSD	Required Information	Location
49-41B-11; 49-41B-21; 49-41B-22	20:10:22:16	Effect on terrestrial ecosystems. The applicant shall provide information on the effect of the proposed facility on the terrestrial ecosystems, including existing information resulting from biological surveys conducted to identify and quantify the terrestrial fauna and flora potentially affected within the transmission site or siting area; an analysis of the impact of construction and operation of the proposed facility on the terrestrial biotic environment, including breeding times and places and pathways of migration; important species; and planned measures to ameliorate negative biological impacts as a result of construction and operation of the proposed facility.	10.0
49-41B-11; 49-41B-21; 49-41B-22	20:10:22:17	Effect of aquatic ecosystems. The applicant shall provide information of the effect of the proposed facility on aquatic ecosystems, and including existing information resulting from biological surveys conducted to identify and quantify the aquatic fauna and flora, potentially affected within the transmission site or siting area, an analysis of the impact of the construction and operation of the proposed facility on the total aquatic biotic environment and planned measures to ameliorate negative biological impacts as a result of construction and operation of the proposed facility.	11.0

SDCL	ARSD	Required Information	Location
49-41B-11 49-41B-22	20:10:22:18	Land use. The applicant shall provide the following information concerning present and anticipated use or condition of the land: (1) A map or maps drawn to scale of the siting area and transmission site identifying existing land use according to the following classification system: (a) Land used primarily for row and nonrow crops in rotation; (b) Irrigated lands; (c) Pasturelands and rangelands; (d) Haylands; (e) Undisturbed native grasslands; (f) Existing and potential extractive nonrenewable resources; (g) Other major industries; (h) Rural residences and farmsteads, family farms, and ranches; (i) Residential; (j) Public, commercial, and institutional use; (k) Municipal water supply and water sources for organized rural water districts; and (l) Noise sensitive land uses; (2) Identification of the number of persons and homes which would be displaced by the location of the proposed facility; (3) An analysis of the compatibility of the proposed facility with present land use of the surrounding area, with special attention paid to the effects on rural life and the business of farming; and (4) A general analysis of the effects of the proposed facility and associated facilities on land uses and the planned measures to ameliorate adverse impacts.	12.0, 17.0
49-41B-11	20:10:22:19	Local land use controls. The applicant shall provide a general description of local land use controls and the manner in which the proposed facility would comply with the local land use zoning or building rules, regulations or ordinances. If the proposed facility violates local land use controls, the applicant shall provide the commission with a detailed explanation of the reasons why the proposed facility should preempt the local controls. The explanation shall include a detailed description of the restrictiveness of the local controls in view of existing technology, factors of cost, economics, needs of parties, or any additional information to aid the commission in determining whether a permit may supersede or preempt a local control pursuant to SDCL 49-41B-28.	13.0

SDCL	ARSD	Required Information	Location
49-41B-11	20:10:22:20	Water quality. The applicant shall provide evidence that the proposed facility would comply with all water quality standards and regulations of any federal or state agency having jurisdiction and any variances permitted.	14.0
49-41B-11; 49-41B-21; 49-41B-22	20:10:22:21	Air quality. The applicant shall provide evidence that the proposed facility would comply with all air quality standards and regulations of any Federal or state agency having jurisdiction and any variances permitted.	15.0
49-41B-11(3)	20:10:22:22	Time schedule. The applicant shall provide estimated time schedules for accomplishment of major events in the commencement and duration of construction of the proposed facility.	16.0
49-41B-11(3); 49-41B-22	20:10:22:23	Community impact. The applicant shall include an identification and analysis of the effects the construction, operation, and maintenance of the proposed facility would have on the anticipated affected area including the following: (1) A forecast of the impact on commercial and industrial sectors, housing, land values, labor market, health facilities, energy, sewage and water, solid waste management facilities, fire protection, law enforcement, recreational facilities, schools, transportation facilities, and other community and government facilities or services; (2) A forecast of the immediate and long-range impact of property and other taxes of the affected taxing jurisdictions; (3) A forecast of the impact on agricultural production and uses; (4) A forecast of the impact on population, income, occupational distribution, and integration and cohesion of communities; (5) A forecast of the impact on transportation facilities; (6) A forecast of the impact on landmarks and cultural resources of historic, religious, archaeological, scenic, natural, or other cultural significance. The information shall include the applicants' plans to coordinate with the local and state office of disaster services in the event of accidental release of contaminants from the proposed facility; and (7) An indication of means of ameliorating negative social impact of the facility development.	17.0

SDCL	ARSD	Required Information	Location
49-41B-11	20:10:22:24	Employment estimates. The application shall contain the estimated number of jobs and a description of job classifications, together with the estimated annual employment expenditures of the applicants, the contractors, and the subcontractors during the construction phase of the proposed facility. In a separate tabulation, the application shall contain the same data with respect to the operating life of the proposed facility, to be made for the first 10 years of commercial operation in 1-year intervals. The application shall include plans of the applicant for utilization and training of the available labor force in South Dakota by categories of special skills required. There shall also be an assessment of the adequacy of local manpower to meet temporary and permanent labor requirements during construction and operation of the proposed facility and the estimated percentage that would remain within the county and the township in which the facility is located after construction is completed.	18.0
49-41B-11(5)	20:10:22:25	Future additions and modifications. The applicant shall describe any plans for future modification or expansion of the proposed facility or construction of additional facilities which the applicant may wish to be approved in the permit.	19.0
49-41B-11	20:10:22:30	Alternate Energy Sources. The applicant shall provide information concerning the alternate energy resources considered in the construction of the energy or wind energy facility. The applicant shall also discuss the reasons for selecting the proposed energy resource rather than an alternative resource.	20.0
49-41B-11	20:10:22:34	Transmission facility layout and construction. If a transmission facility is proposed, the applicant shall submit a policy statement concerning the route clearing, construction and landscaping operations, and a description of plans for continued right-of-way maintenance, including stabilization and weed control.	22.0

SDCL	ARSD	Required Information	Location
49-41B-11	20:10:22:35.	Information concerning transmission facilities. If a transmission facility is proposed, the applicant shall provide the following information as it becomes available to the applicant: (1) Configuration of the towers and poles, including material, overall height and width; (2) Conductor configuration and size, length of span between structures and number of circuits per pole or tower; (3) The proposed transmission site and major alternatives as depicted on overhead photographs and land use culture maps; (4) Reliability and safety; (5) Right-of-way or condemnation requirements; (6) Necessary clearing activities; and (7) If the transmission facility is placed underground, the depth of burial, distance between access points, conductor configuration and size and number of circuits.	N.A.23.022.0
49-41B-7; 49-41B-22	20:10:22:36.	Additional information in application. The applicant shall also submit as part of the application any additional information necessary for the local review committees to assess the effects of the proposed facility pursuant to SDCL 49-41B-7. The applicant shall also submit as part of its application any additional information necessary to meet the burden of proof specified in SDCL 49-41B-22.	2423.0
49-41B-11; 49-41B-22	20:10:22:37.	Statement required describing gas or liquid transmission line standards of construction. The applicant shall submit a statement describing existing pipeline standards and regulations that would be followed during construction and operation of the proposed transmission facility.	N/A
49-41B-11; 49-41B-22	20:10:22:38.	Gas or liquid transmission line description. The applicant shall provide the following information describing the proposed gas or liquid transmission line: (1) A flow diagram showing daily design capacity of the proposed transmission facility; (2) Changes in flow in the transmission facilities connected to the proposed facility; (3) Technical specifications of the pipe proposed to be installed, including the certified maximum operating pressure, expressed in terms of pounds per square inch gauge (psig); (4) A description of each new compressor station and the specific operating characteristics of each station; and (5) A description of all storage facilities associated with the proposed facility.	N/A

SDCL	ARSD	Required Information	Location
49-41B-11	20:10:22:39.	Testimony and exhibits. Upon the filing of an application pursuant to SDCL 49-41B-11, an applicant shall also file all data, exhibits and related testimony which the applicant intends to submit in support of its application. The application shall specifically show the witnesses supporting the information contained in the application. Such filing would be made consistent with the prehearing conference order.	2524.0

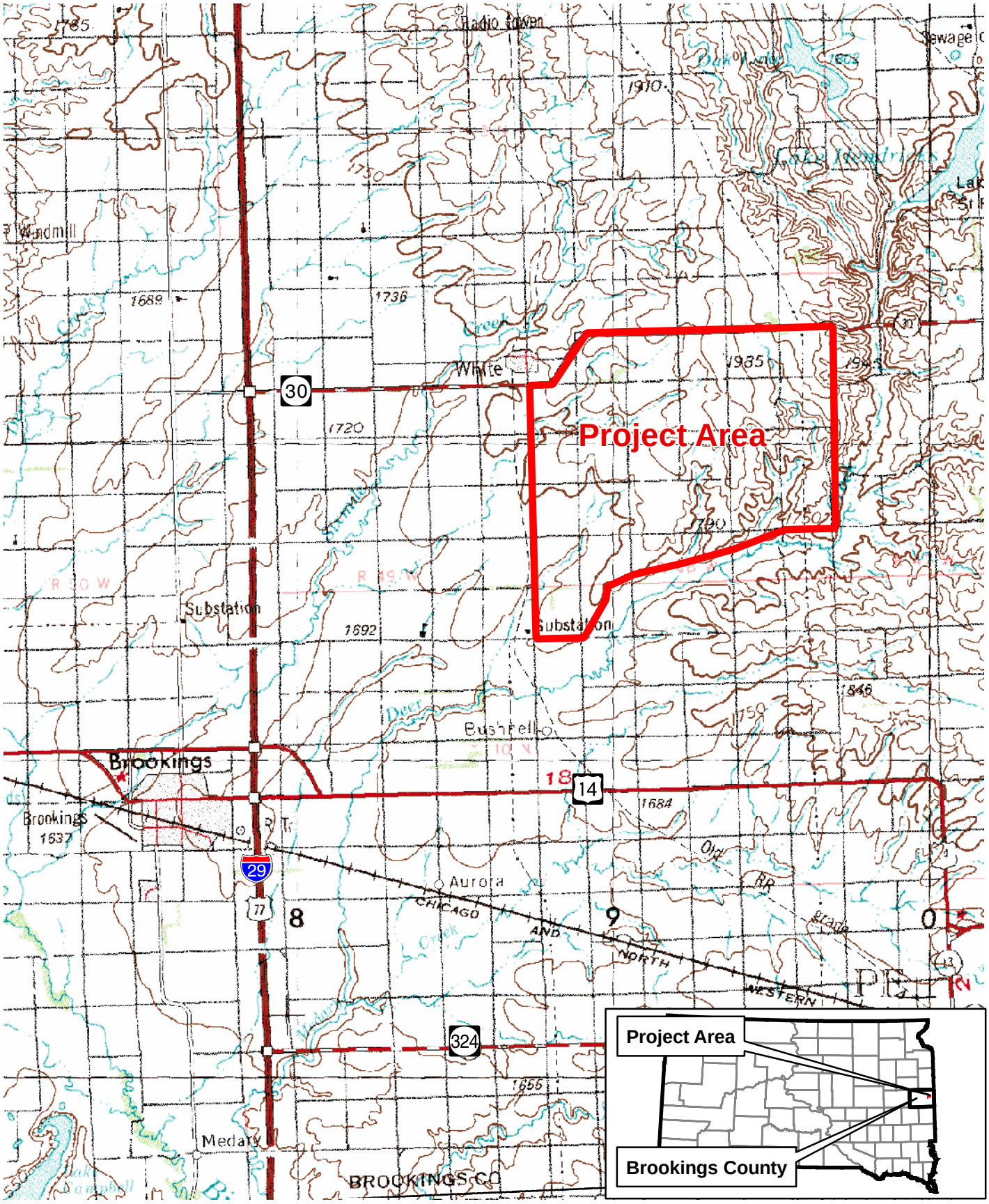

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Figure 1 - Facility Location Map
White Wind Farm
Brookings County, SD

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EXECUTIVE SUMMARY

White Wind Farm, LLC (the Applicant), a wholly owned subsidiary of Navitas Energy, Inc., proposes to construct and operate the White Wind Farm on approximately 93 acres dispersed throughout portions of up to 25 sections of land in eastern Brookings County, South Dakota, southeast of the City of White. The Project would have a net capacity of up to 200 MW. The purpose of this Project is to develop the identified wind resource in the Brookings County area to meet a portion of the regional demand for renewable power.

The Project would consist of modifying the Western Area Power Administration's (Western) White Substation; constructing, operating and maintaining electric collector lines, a collection substation and an interconnection to the White Substation; constructing, operating and maintaining up to 105 2-MW wind turbine generators (WTGs), and constructing and maintaining access roads connecting the WTGs.

The Project proposes an interconnection with Western's White Substation. Western is required to respond to the Applicant's request for interconnection to their transmission facility and ensure reliability of the Federal Power System. Western is a division of the US Department of Energy; therefore, the interconnection requires a Federal action by Western. Western is subject to NEPA; therefore, an EIS for the White Wind Farm is in process.

This Application provides information on the existing resources and potential environmental consequences from the Project on the following resources: physical (geology, economic deposits, soils), hydrology (water), terrestrial ecosystems (vegetation, wetlands, wildlife, threatened and endangered species), aquatic ecosystems, land use (agriculture, residential, displacement, noise, aesthetics, electromagnetic interference, safety and health), water quality, air quality and communities (socioeconomics, cultural resources).

During construction of the Project, fugitive dust emissions would increase due to truck and equipment travel in the area. The additional particulate matter emissions are not expected to exceed the National Ambient Air Quality Standards (NAAQS). The Project would produce no air emissions during its operation.

The 105 acres of new impervious surface represent less than 0.5 percent of the total acreage in the Project area; therefore, the Project is not expected to cause major changes in runoff patterns, volume of runoff or land use changes.

Because wetlands within the Project area are relatively small and widely scattered, the Applicant anticipates that the Project would be able to avoid most wetland areas. Turbines would be constructed in the upland hill areas, avoiding the low-lying wetlands.

A comparison of the Project site to a neighboring area of high quality natural habitat shows the potential for adversely affecting wildlife is substantially lower at the proposed site than at comparable, adjacent areas of higher quality habitat.

Construction activities for this project would be short-term. Therefore, no long-term impact to the socioeconomics of the area is expected; any short-term effects likely would be beneficial to local businesses.

Mitigation measures proposed for the Project include the following:

- Turbines would not be located near sensitive habitats
- Turbines would not be illuminated, except as required by Federal Aviation Administration (FAA) regulations.
- Existing roads would be used for construction and maintenance where possible. Road construction would be minimized to the extent possible.
- The Project would comply with Brookings County zoning requirements on setbacks from residences, property lines and roads, turbine spacing, noise, and decommissioning plans.
- Access roads created for the wind farm facility would be located on gentle grades to minimize visible cuts and fills.
- Temporarily disturbed areas would be reseeded to blend in with existing vegetation.
- Best management practices (BMPs) would be used during construction to control erosion and ensure that drainage ways and streams are not impacted by sediment runoff from exposed soils.
- The Project would use solid towers for WTGs instead of lattice tower structures, to minimize potential avian and visual impacts.
- The Applicant would construct any overhead power lines required for the project in accordance with the current guidelines for preventing raptor electrocutions.
- A Class III cultural resources survey would be prepared for areas proposed for construction of the wind turbines, associated access roads and staging areas, and other elements proposed for development.

In this Application, the Applicant has addressed all those matters set forth in SDCL Chapter 49-41B and in ARSD Chapter 20:10:22 (entitled Energy Facility Siting Rules) related to wind energy facilities. Included with this Application is a Completion Checklist (Table 1) that sets forth where in the Application each requirement of the rules is addressed.

Pursuant to SDCL 49-41B-22, the information presented here establishes that:

1. The proposed wind energy facilities comply with all applicable laws and rules;
2. The facilities would not pose a threat of serious injury to the environment or to the social and economic condition of inhabitants in, or near the Project area;
3. The facilities would not substantially impair the health, safety or welfare of the inhabitants; and
4. The facilities would not unduly interfere with the orderly development of the region, having given consideration to the views of the governing bodies of the local affected units of government.

1.0 NAMES OF PARTICIPANTS (ARSD 20:10:22:06)

The Applicant (Participant) is White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. Listed below are the contact persons and contact information for the owner and manager of the proposed Project. The owner contact (Mr. Christopher Moore) is the person authorized to receive communications relating to the Application on behalf of the Applicant.

2.0 NAME OF OWNER AND MANAGER (ARSD 20:10:22:07)

The Owner of the proposed Project is Navitas Energy, Inc. Contact person for the Owner is:

Paul Eberth, Senior Project Developer or Christopher F. Moore, Managing Director

Navitas Energy, Inc.
3001 Broadway Street NE
Minneapolis, MN 55413
(Phone) 612-370-1061
(FAX) 612-370-9005
peberth@windpower.com

The Manager of the Project is White Wind Farm, LLC – a wholly owned subsidiary of Navitas Energy. Contact person for the Manager is:

Gabriel Alonso
Gamesa Energy USA
1 South Broad Street, 20th Floor
Philadelphia, PA 19107
Phone: (215) 665-9810
Fax: (215) 665-9811

3.0 PURPOSE OF, AND DEMAND FOR, THE WIND ENERGY FACILITY (ARSD 20:10:22:08)

White Wind Farm, LLC (Applicant), proposes to construct and operate the White Wind Farm, a wind energy electricity generating facility and ancillary facilities (Project), in Sherman Township in Brookings County, South Dakota (Figure 1, Project Location). The Applicant is wholly owned by Navitas Energy, Inc. The Applicant has applied for an interconnection with Western Area Power Administration's (Western) transmission system at the existing White Substation. The Applicant is planning to begin construction in 2007 and anticipates an 8-month construction schedule. However, this schedule is subject to negotiations with utilities and may change.

The purpose of this Project is to develop the identified wind resource in the Brookings County area to meet a portion of the regional demand for renewable power. The following sections outline the

regional demand for renewable power, the identified regional wind resource and the transmission capacity available to provide an outlet for renewable power to serve the demand. These three elements combine to create the need for this Project; no one element is sufficient in and of itself.

3.1 WIND RESOURCE AREAS

Wind-powered electric generation is entirely dependent upon the availability of the wind resource at a specific location. The energy available from the wind increases at the third power of the wind speed. In other words, a doubling of the wind speed would increase the available energy by a factor of 8 times.

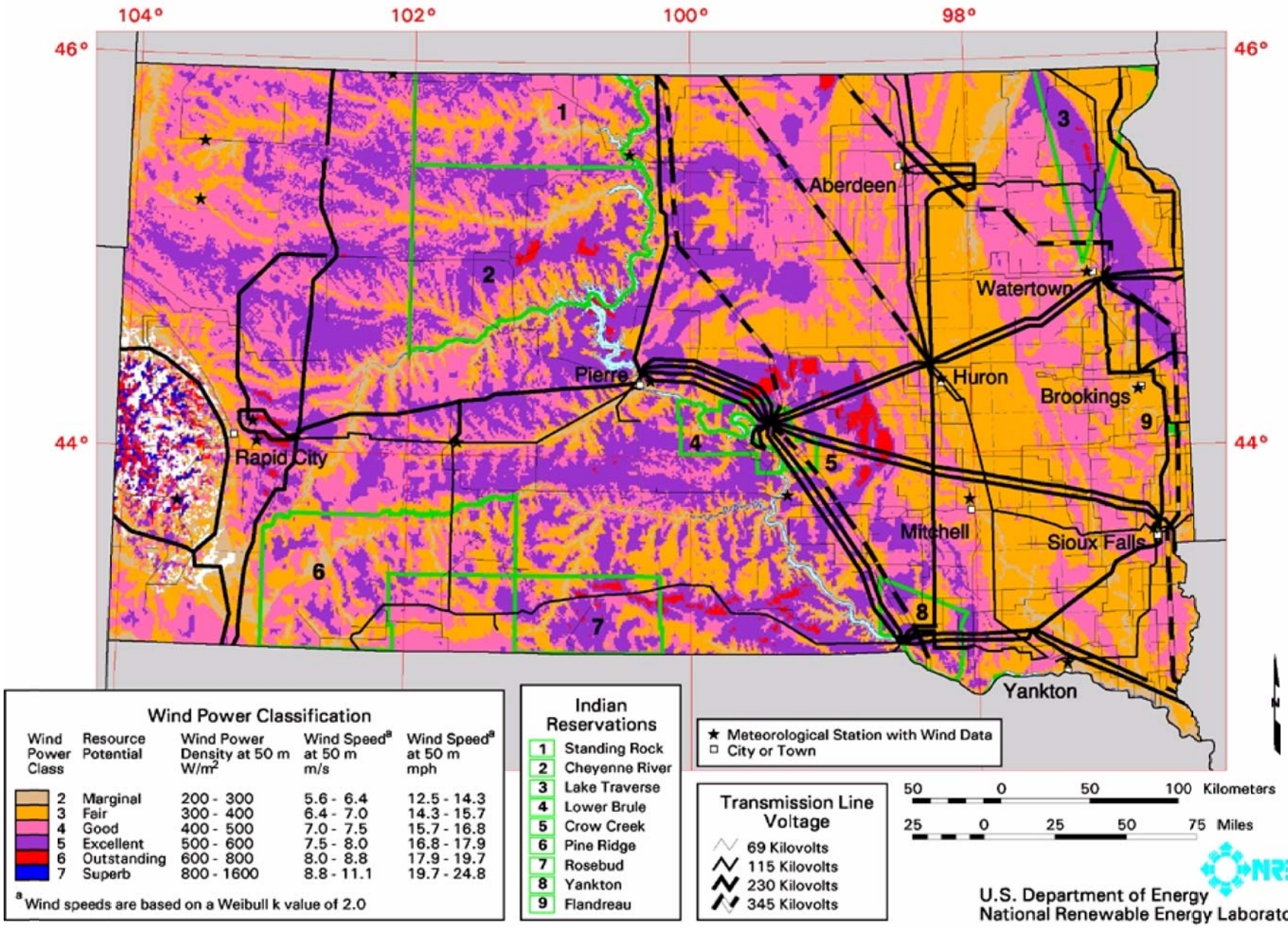
The cost-effective designs of wind turbine generators (WTGs) optimize wind and land resources. Therefore, they operate when sufficient wind speeds are available. The financial viability of the WTGs would also greatly depend on the frequency, duration and timing of sufficient wind speed. These factors have led to the defining and mapping of wind resources.

The American Wind Energy Association (AWEA) has ranked South Dakota as having the fourth highest wind potential in the country. There were approximately 44 megawatts (MW) of wind generation installed in the state as of April 2005 (AWEA, 2005). The National Renewable Energy Laboratory (NREL) has rated the wind resources in the Project area (Buffalo Ridge in Minnesota and South Dakota) as Class 5, or excellent (Figure 2 South Dakota Wind Resource Map). Table 2 shows the existing and total potential wind power for South Dakota and the surrounding states.

TABLE 2
MIDWEST WIND POWER

	Existing (MW)	**Total Potential (MW)**	**Potential 2010 Energy Requirements for Existing or Proposed Renewable Energy Mandates**	
			Mandate of 5 percent	***Mandate of 10 percent***
Illinois	76	6,980	2,668	5,336
Iowa	632	62,900	827	1,654
Minnesota	615	75,000	1,250	2,499
Nebraska	14	99,100	559	1,118
North Dakota	66	138,400	220	440
South Dakota	44	117,200	187	374
Wisconsin	53	6,440	1,373	2,726
Total	**1,500**	**506,020**	**7,073**	**14,147**

Source: Wind on the Wires



NAVITAS ENERGY

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Figure 2 - South Dakota Wind Resource Map
White Wind Farm
Brookings County, SD

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3.2 RENEWABLE POWER DEMAND

Deregulation of the electric industry and current energy supply issues have emphasized the need for new and diverse energy sources. State and Federal policies combined with the declining costs of wind generation have made wind power more attractive to utilities seeking to diversify their generation portfolios. Wind accounts for less than 1 percent of the electricity generated in the U.S. today, but installed capacity has been expanding at an average annual rate well exceeding 20 percent. A comparison of utility generation by fuel type shows that wind generation is now the fastest growing segment of electric power generation.

Several states have implemented policies that encourage the development of wind energy projects. As of February 2005, 18 states and the District of Columbia have renewable portfolio standard laws. These states include Minnesota, Iowa and Wisconsin. Minnesota has a non-mandated target of 10 percent by 2015. In addition, an agreement between Xcel Energy and the state of Minnesota for the Minnesota service area presently calls for 425 MW of wind in addition to the existing wind power. The Federal government has provided, and would continue to provide, production tax credits for wind power to encourage investment and provide some financial stability to allow projects to develop.

These mandates and related agreements have led regulated utilities to increase wind power as a percentage of their generation portfolio. Typically, this need is met when unregulated wind energy developers respond to resource requests issued by utilities. Successful developers typically develop, own and operate the wind farm and sell the wind power to a given utility through a long-term power purchase agreement (PPA). The combination of policy and market drivers is expected to create an increased demand for wind power. This is demonstrated in a number of ongoing regional transmission planning studies that cover Minnesota and South Dakota. As Table 2 illustrates, high-potential wind resources are not coincident with areas of high electric load. These studies are all consistent in forecasting that the wind resource in the Project area (Buffalo Ridge in Minnesota and South Dakota) would be the primary source of wind power to meet regional demand.

- Midwest Independent System Operator (MISO) Northwest Exploratory Study, which forecasts 500 MW of wind power in the Project area (Grivna, 2005);
- MISO Iowa/Minnesota/Wisconsin Exploratory study, which forecasts the addition of 800 to 1100 MW of wind power in the Project area (Deubner, 2005);
- CapX 2020, which forecasts an additional 2400 MW of wind power in Minnesota and surrounding states (CapX, 2005);
- Buffalo Ridge Incremental Generation outlet transmission study, which forecasts over 400 MW of wind power in the Project area (Gonzalez, 2005);
- Western's Dakotas Wind Transmission Study, which forecasts an additional 500 MW of wind energy in the Project area (Weber, 2005).

3.3 TRANSMISSION CAPACITY

The final element leading to defining a potential wind resource is electrical transmission access. The most economical developments occur where large numbers of WTGs can be located to achieve economies of scale; this correspondingly requires an adequate transmission outlet. Although there are several areas with excellent wind resource in the Buffalo Ridge area, transmission access is constrained. Therefore, the availability of transmission in the area improves the suitability of the Project area for large-scale wind projects. Wind farm developers must determine if capacity exists near a given wind resource by working with the transmission owners and regional transmission operators such as MISO or Western. The developer must also make a request for any available capacity, which would be weighed by MISO or Western against the other competing demands. Finally, the developer must ensure that any interconnection where capacity has been reserved meets stringent interconnection design standards to ensure reliability on the transmission grid for all users. All of these factors lead to a very limited number of viable locations to support economic and logistic development of a given wind resource. (Interconnection request of August 7, 2001. Queue number 37110-01.)

4.0 ESTIMATED COST OF THE WIND ENERGY FACILITY (ARSD 20:10:22:09)

The estimated capital cost of the White Wind Farm is $300 million. This cost includes planning, easement acquisition, permitting and construction.

5.0 GENERAL SITE DESCRIPTION (ARSD 20:10:22:11)

The Project would be located on approximately 105 acres dispersed throughout portions of up to 25 sections of land in eastern Brookings County, South Dakota, near the City of White (Figure 1). The Project consists of up to 105 2-MW WTGs with a net capacity of up to 200 MW. The Project area covers approximately 28 square miles; mostly within Sherman Township, where the Project would be constructed, and approximately 1.3 sections in Alton Township. There are no railroads, cemeteries, historic sites, public facilities (other than roads) or cities within the Project area.

The Project would consist of modifying Western's White Substation, constructing, operating and maintaining electric collector lines, a collection substation and an interconnection to the White Substation. Also, constructing, operating and maintaining up to 105 2-MW WTGs; and constructing and maintaining access roads connecting the WTGs. See Figure 3 (Proposed Project Layout). The Applicant plans to begin construction in 2007 and anticipates an 8-month construction schedule. However, this schedule is subject to negotiations with utilities and may change.

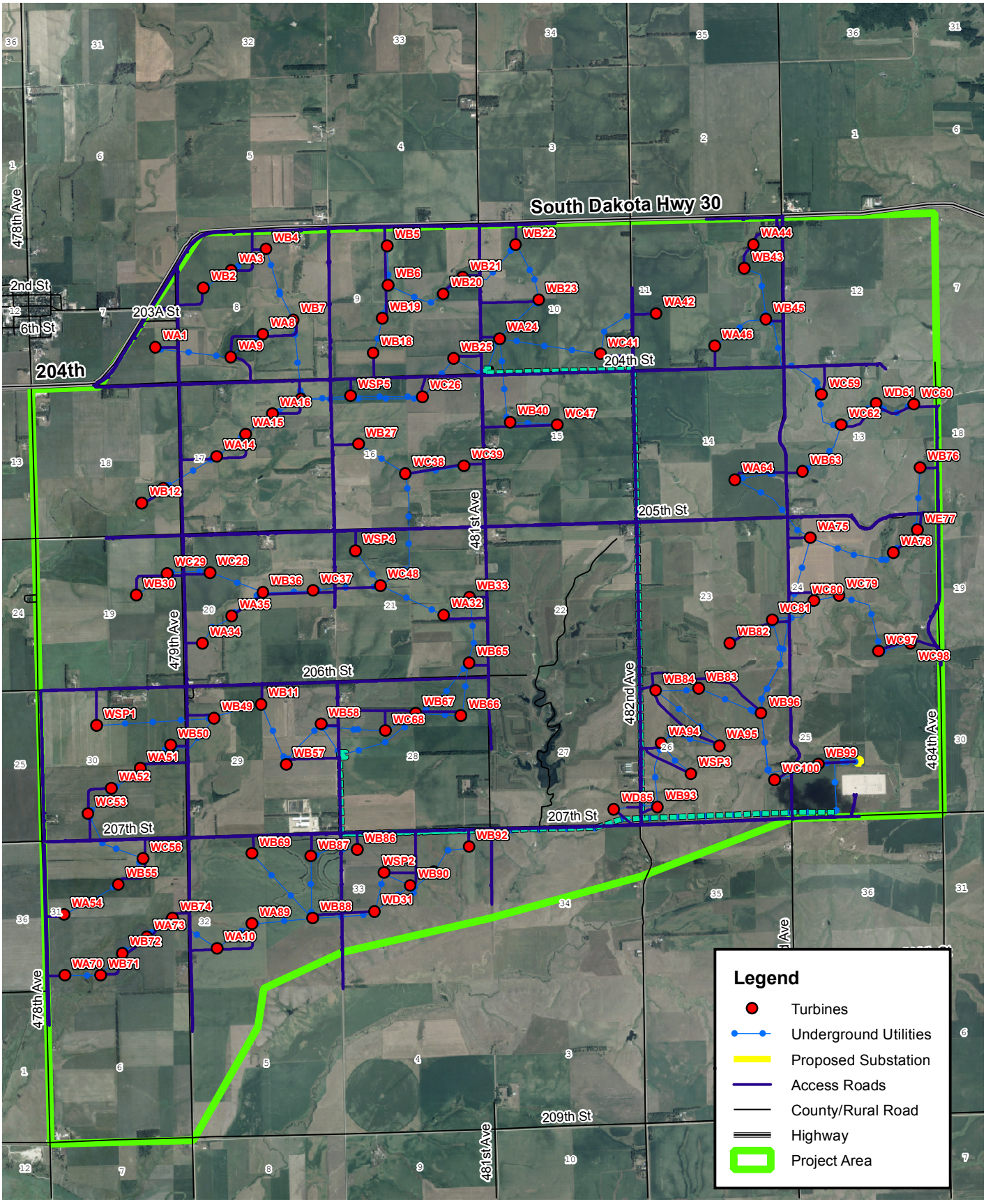

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Figure 3
Proposed Project Layout
White Wind Farm
Brookings County, SD

White Wind Farm LLC
Confidential for Business, Market, and Infrastructure Reasons
DO NOT DISTRIBUTE

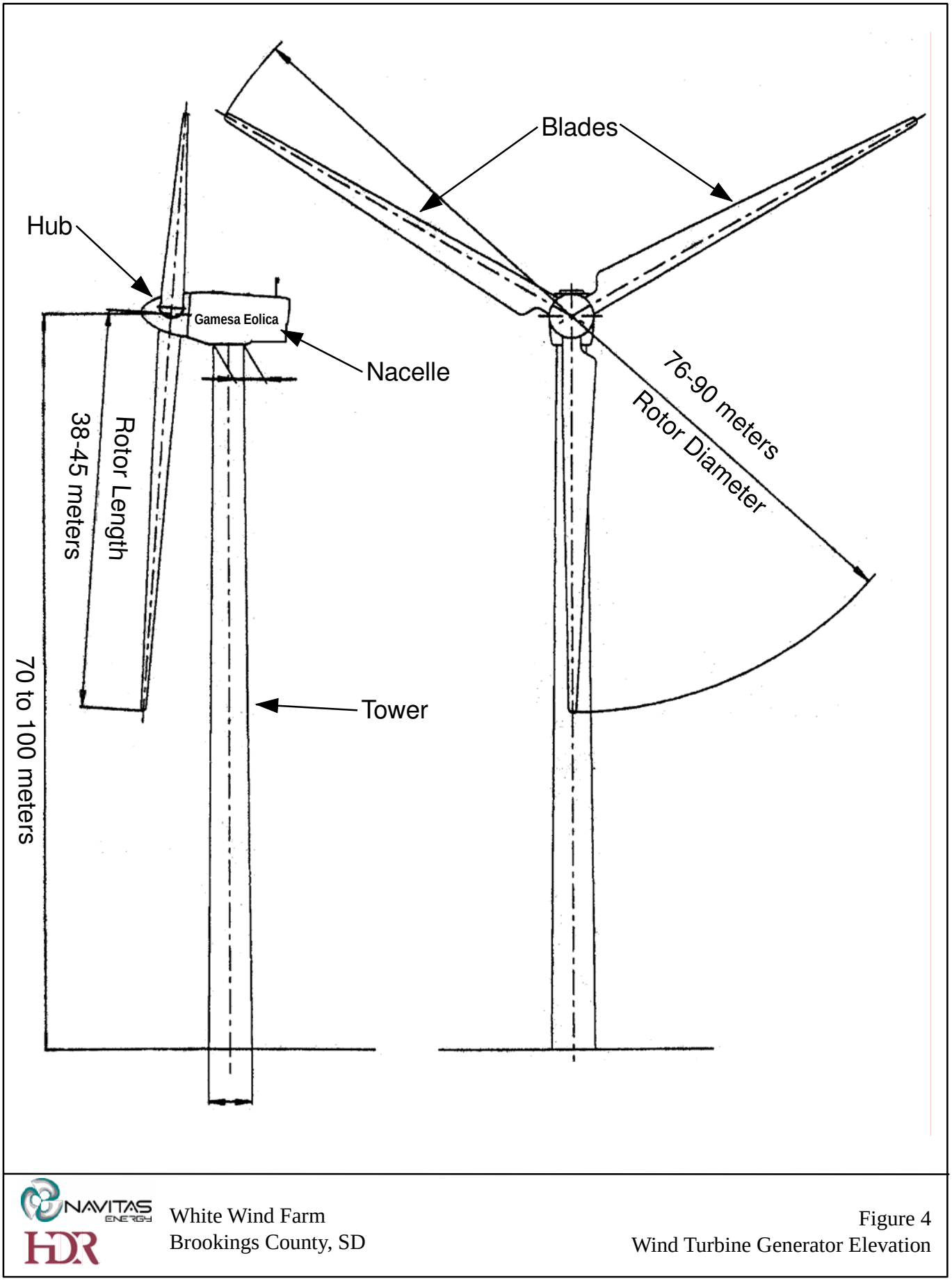
5.1 WIND TURBINE GENERATORS

The Applicant anticipates using Gamesa Wind 2-MW WTGs, although exact turbine models are subject to change to ensure selection of a turbine that is cost-effective and optimizes land and wind resources. Each WTG is mounted on a single steel tower, approximately 70 to 100 meters high and approximately 5 meters in diameter, secured by a concrete foundation. Each WTG has three blades. The length of the blades is dependent upon the turbine model chosen, but the Applicant anticipates that blades would be between 38 and 45 meters long. Figure 4 shows a representative WTG with a tower of 78 meters and a blade length of 43.5 meters; actual turbine dimensions for this project may vary somewhat.

As the wind passes over the blades, it creates lift and causes the rotor to turn. The rotor is connected by a hub and main shaft to a system of gears, which are connected to a generator. Each WTG is equipped with a wind speed and direction sensor that communicates to the turbine's control system to signal when sufficient winds are present for safe operation. The WTG would operate at up to 19 revolutions per minute (rpm). A control panel is housed inside the base of each tower. The tower would be lighted to comply with the minimum FAA requirements.

The size and shape of the concrete foundation for each turbine would be determined after exact turbine types are determined and soil borings are taken to determine more information on location-specific soil characteristics. Preliminary engineering indicates a foundation size between 40 and 60 feet in diameter and 6 to 8 feet deep (Figure 5).

Each WTG would be accessible via all-weather Class 5 gravel roads, ditched where needed, providing access to the turbines via public roads. Access roads would follow fence lines and existing tracks to the extent possible.



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NAVITAS ENERGY
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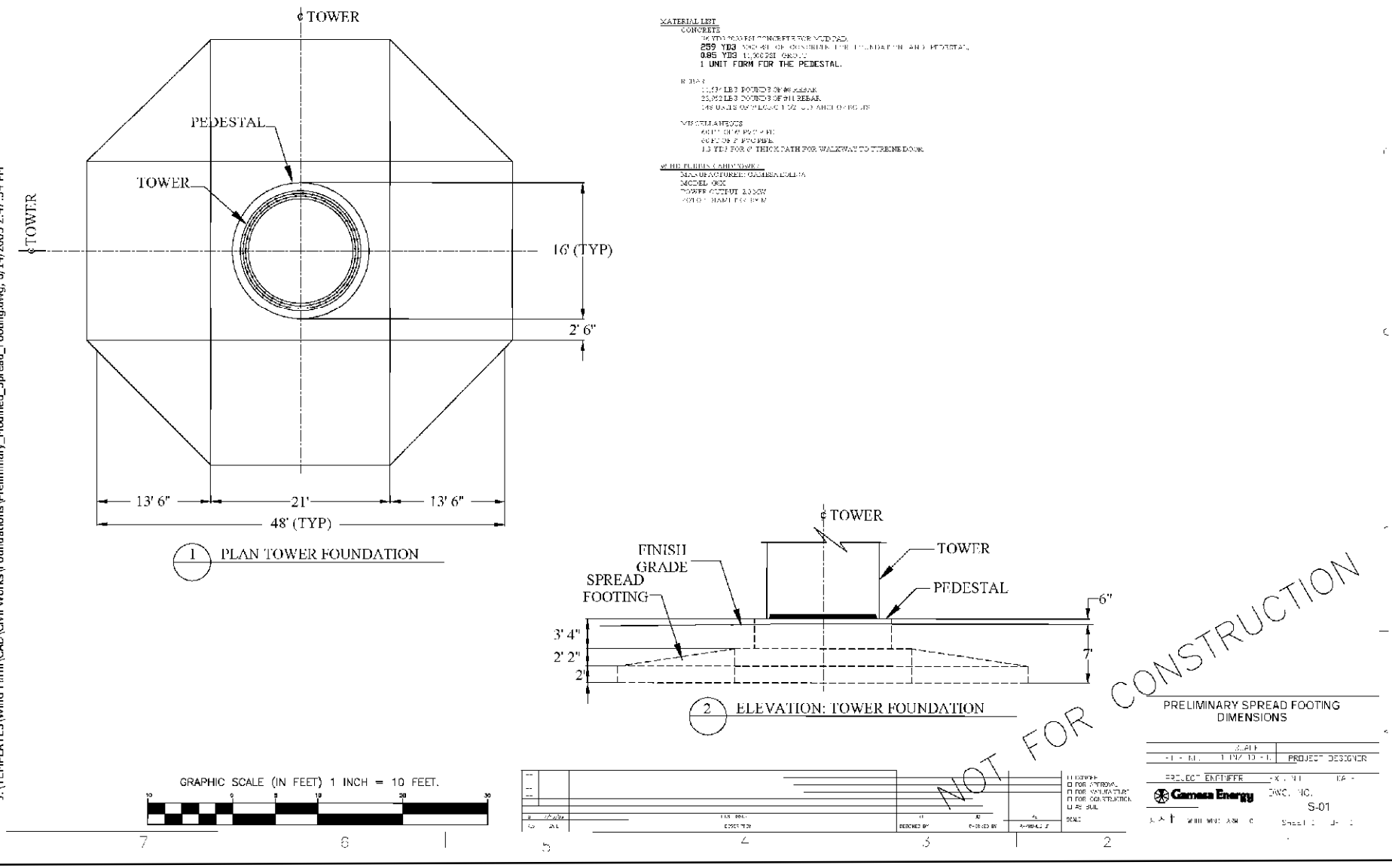
White Wind Farm
Brookings County, SD

Figure 4
Wind Turbine Generator Elevation



NAVITAS ENERGY

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Figure 5
Foundation Drawing

5.2 ELECTRIC COLLECTOR SYSTEM, COLLECTION SUBSTATION AND INTERCONNECTION FACILITIES

The WTGs would be interconnected by communication and electrical power collection circuit facilities within the wind farm. These facilities would include a combination of underground and overhead feeder lines that would deliver wind-generated power to the Project collection substation. Approximately 45 miles of underground collection lines and 9 miles of overhead collection lines would be constructed. The 34.5 kV overhead lines would model a standard overhead distribution line consisting of wooden poles approximately 25 to 30 feet tall and spaced approximately 150 feet apart along the road right of way (ROW) and over private land. The overhead lines would switch to underground to accommodate a lower impact off the road ROW. Each underground collector line would consist of three power cables contained in an insulated jacket and buried at a depth that would not interfere with farm operations.

A new collection substation would be constructed adjacent to the existing White substation located on the northwest corner of 207th Street and 484th Avenue (Section 25, Township 111 North, Range 48 East), in the southeast corner of the Project area. The new collection substation would be constructed on private land just north of, and adjacent to, the existing White substation. The medium voltage (34.5 kV) wind farm collection grid and the wind farm fiber optic communication network would terminate at the new collection substation. The facility would include a transformer to step up the voltage of the collection grid to that of the interconnection with Western. Additional facilities located within the new substation include aboveground bus structures to interconnect the substation components, breakers, a building for relays, switchgear, communications and controls, and other related facilities required for delivery to the existing 345 kV bus at the Western's White Substation. The new collection substation would be surrounded by a high chain-link security fence and the surfaces would consist of concrete and steel foundations for the substation components and a graveled surface.

Design of the proposed Project collection substation is not finalized, but the Applicant expects the facility would require a site of up to 1.1 acres. A preliminary collection substation layout is included (Figure 6). The facility would be designed in compliance with Federal, state and local regulations, and applicable industry standards, as well as Western interconnection standards. The new collection substation would then be interconnected to Western's White substation (See Section 23.0 for details regarding the interconnection facility.

5.3 WESTERN'S WHITE SUBSTATION MODIFICATIONS

Western anticipates that electric output from the Project can be incorporated into the White Substation with an expansion of the existing 345 kV ring bus to a 4-breaker ring bus. The 4-breaker ring bus would be constructed for future expected conversion to a breaker-and-a-half arrangement. Pending other concurrent development at the White substation, the conversion to a breaker-and-a-half arrangement may need to be incorporated into the construction stage. The potential breaker-and-a-half arrangement is subject to change based upon expansion requirements to accommodate other interconnection requests at the White substation. No expansion of WAPA sub beyond existing footprint is required to accommodate the White Wind Farm Substation.

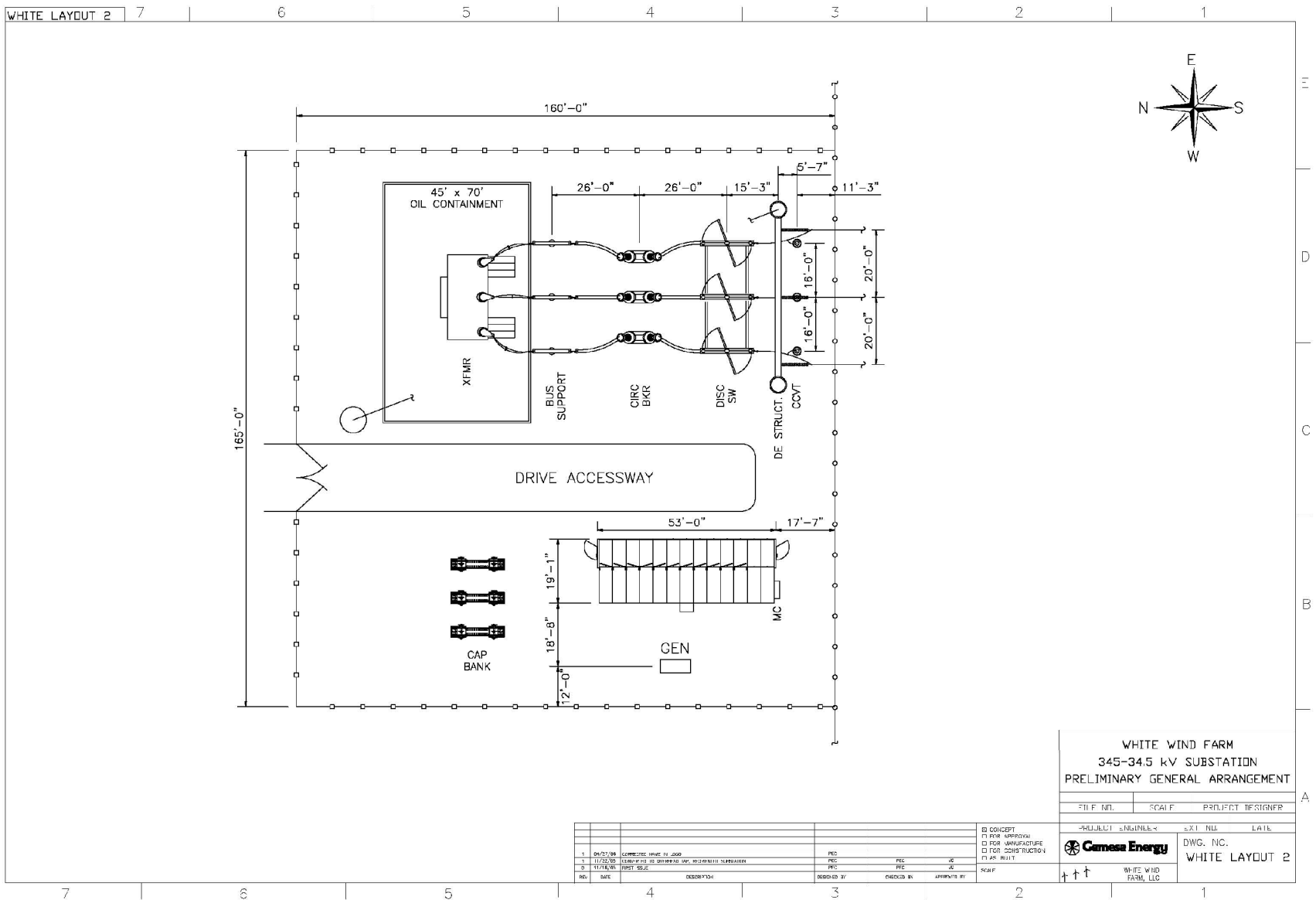

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Figure 6
Substation Layout

6.0 ALTERNATE SITES AND SITING CRITERIA (ARSD 20:10:22:12)

6.1 RENEWABLE ENERGY DEMAND

Navitas Energy is responding to the specific opportunities in the market. Leading opportunities exist with Minnesota utilities like Great River Energy or Xcel Energy due to state mandates. Minnesota utilities typically require that potential renewable power suppliers be located in or near the utilities' service area. Therefore, to maximize the potential for securing a PPA with a Minnesota utility, the wind farm needs to be located in close proximity to their respective Minnesota service areas. Navitas has capitalized on these criteria in the past by locating wind generation facilities on the Buffalo Ridge in Minnesota, which is only approximately 6 miles from the proposed White Wind Farm. Therefore, Navitas limited their search for a new wind farm to Minnesota and surrounding states (Renewable Energy Objective in Minnesota is 20 percent by 2020).

Criteria:

- Location in or near Minnesota utility service areas.

6.2 WIND RESOURCE

Utility-scale wind farms require the right kind of wind conditions. Navitas reviewed large scale wind resource mapping to identify the highest wind resource areas. A prominent feature on the wind resource maps is the Buffalo Ridge geographic feature, which runs from the northwest to southeast from South Dakota into Minnesota. This feature, which shows up on Figure 2 as an "Excellent" wind resource, is due to the elevation difference provided by the Ridge from the surrounding landscape. For this reason, coupled with resource demand from Minnesota utilities, the Buffalo Ridge has been home for much of the existing wind generation development that has occurred. Over 300 WTGs are located in Minnesota on the Buffalo Ridge. Many of the wind generation facilities are located in and around Lake Benton, Minnesota; development has spread along the ridge northwest to the South Dakota border and southeast towards Worthington, Minnesota. A comparable wind resource is required for Navitas to develop a competitive wind farm.

Large scale wind resource maps, however, are not sufficient for actually locating a wind turbine, since they are generated over a large geographic region, without detailed verification of the local terrain. In order to make proper calculation of annual electricity output, one would need to go to the prospective site, verify the resource, and locate obstacles such as buildings and trees. Meteorologists already collect wind data for weather forecasts and aviation, and that information is often used to assess the general wind conditions for wind energy in an area. However, wind speeds are heavily influenced by the surface roughness of the surrounding area, of nearby obstacles (such as trees or other buildings),

and by the contours of the local terrain. Therefore, a specific site within a proposed project area needs to be selected to establish a meteorological tower for detailed analysis based on the professional experience of the wind developer. Navitas chose to examine a site specific wind resource close to existing facilities on Buffalo Ridge that they worked on, as they best understood the potential wind resource in this area. The area northwest of the Western White Substation was selected for analysis, as the area to the southeast was a lower elevation and crossed by Deer Creek, which could have potential design and environmental ramifications, and the areas to the east are developed or under development (Figure 1). Navitas currently has two meteorological towers within the project area collecting data on the wind.

The next step was to determine where leases could be secured with landowners. Wind-powered projects must be contained within a "small" area for economic and performance viability reasons. A widely spread-out project would require a costly collector system, which in turn would create electrical losses, and thus decrease its economical feasibility, while increasing operational risk. As a result, the Project area, as shown in Figure 1, was developed to define the extent of economically viable collector systems to direct lease efforts. Wind-powered projects typically enter into 20- or 30-year leases with landowners, which, for the most part, are farmers. These leases require a series of commercial and legal obligations between the parties. Whereas, most farmers are comfortable with those obligations, but not every farmer chooses to participate in such projects. Out of the approximately 25 sections selected to be included in the project, eight were not available for various reasons, most for lack of agreement with the landowner. A higher ratio of unavailable sections would have forced the Applicant to abandon the Project area.

Typically, each wind-powered generator, the associated access road and other small infrastructures utilize less than 1 acre of land. On a site with the specific roughness and wind resources such as what is found on the Buffalo Ridge, the optimum spacing between generators is no less than 1,500 feet on a perpendicular line to the prevalent wind direction. Further, counties and townships have siting ordinances (i.e. setbacks) restricting the location of generators near residences and public roads.

As discussed in this section, the issues of available land, need for legal land use obligations (leases), spacing requirements for turbines and local setback requirements significantly reduce the number of sites available for the operation of a wind-powered project.

Criteria:

- Available area of undeveloped highest wind resource comparable to wind resource captured by existing facilities on Buffalo Ridge;
- Suitable site-specific conditions based on wind developer meteorological tower data;
- Ability to secure a sufficient number of landowner leases within the proposed site development area.

6.3 TRANSMISSION

The third overriding factor that determines the selection of the site is access to economically viable transmission facilities. Existing wind generation facilities on the Buffalo Ridge in Minnesota were initially developed in and around Lake Benton to take advantage of transmission access through Xcel Energy's Buffalo Ridge substation located southeast of Lake Benton. For Navitas to develop a competitive facility comparable access would be needed. Western's White Substation provides a comparable opportunity. The White Substation is also conveniently located on the Buffalo Ridge in the area of the next available highest wind resource as discussed above. The location of the White Substation provided further criteria leading to the set boundaries of the Project area for viable alternative locations that met the purpose and need.

Criteria:

- Availability of cost-effective transmission access;
- Availability of adequate transmission capacity.

6.4 SITE CONFIGURATION ALTERNATIVES

An initial turbine layout was developed by Navitas in early 2005. This initial layout was based on an optimal configuration to best capture wind energy. This layout was then adjusted to avoid environmental and socio-economic impacts The current layout is shown in Figure 3. Benefits achieved by revising the layout included avoiding placement of nine wind turbine foundations in or very near to 100-year floodplains. One of the floodplains in question was Six Mile Creek, which the USFWS has listed as potential habitat for the Topeka shiner, an endangered species. The current layout incorporates setbacks, as provided for in the Brookings County ordinances, which resulted in avoiding the placement of foundations very near to roads and homes.

Criteria:

- Minimize environmental impact;
- Comply with local setback ordinances.

6.5 RELIANCE ON EMINENT DOMAIN POWERS

Since Navitas Energy is not a public utility, it did not rely on eminent domain powers to acquire easements for the wind energy facility. Access to all required properties for the wind energy facility has been obtained through voluntary signing of leases by property owners. Private land would be used for all facilities except the two double-circuit overhead lines ("Feeders"). These Feeders would be located in Public Road ROWs, where Public Road ROW is available, as requested in the Brookings County Zoning Ordinance and on private land with permission from the affected landowner.

7.0 ENVIRONMENTAL INFORMATION (ARSD 20:10:22:13)

Sections 9.0 through 11.0 and Sections 14.0, 15.0 and 17.0 provide a description of the existing environment at the time of the application submission, estimates of changes in the existing environment, which are anticipated to result from construction and operation of the proposed White Wind Farm, and irreversible changes that are anticipated to remain beyond the operating lifetime of the facility.

8.0 EFFECT ON PHYSICAL ENVIRONMENT (ARSD 20:10:22:14)

This section provides background on the geology within the Project Area to provide the reader with an understanding of the Project's geologic setting and soil resources. The affected environment for soils are considered areas of disturbance within the Project area.

8.1 EXISTING PHYSICAL ENVIRONMENT

8.1.1 GEOLOGY

8.1.1.1 Surficial Geology

Upland features dominate the northern and central portions of the Project area. The uppermost-unconsolidated sediment unit underlying the majority of these uplands is the Tazewell ground moraine, which is a grey to brownish pebble-clay till formed during the Wisconsinan glacial advance. The Iowa ground moraine (likely lower Wisconsinan or upper Illinoisan), also a pebble-clay till, is present in portions of the uplands along the western edge of the Project area. Drainage features are present throughout the Project area. Sediments associated with these drainage features include recently deposited quaternary alluvium in the bottom of the stream valleys with older outwash deposits at higher elevations on the valley walls. The unconsolidated deposits in the transitional areas between the uplands and the drainage features tend to consist of the remnants of outwash plains and kame terraces.

Review of boring logs in the Project area indicates that unconsolidated sediments are between 500 and 600 feet thick. The stratigraphy of these sediments consists of a series of interbedded till and outwash deposits, representative of the sequence of glacial advances and retreats of the Quaternary Period (Lee, 1957).

8.1.2 BEDROCK GEOLOGY

The uppermost bedrock in the northern, eastern and central portions of the Project area is the upper Cretaceous Niobrara formation. The Niobrara formation is comprised of interbedded chalk, marl and shale, and is generally white to dark grey in color. In the western portion of the Project area, the upper Cretaceous Pierre Shale overlies the Niobrara; the Pierre Shale is described as a blue-grey to dark grey fissile to blocky shale. The uppermost bedrock unit in the southern portion of the Project area is the lower Proterozoic Sioux Quartzite, which is described as a pink and reddish to tan fine to coarse-grained orthoquartzite (Tomhave and Schultz, 2004).

8.1.3 ECONOMIC DEPOSITS

The primary economic geologic deposits in the Project area consist of sand and gravel. The main economic uses for these resources are in construction, primarily road base and concrete aggregates. Review of United States Geological Survey (USGS) 7.5 minute quadrangle mapping, aerial photography and a field review of the Project area revealed gravel pits in or near the Project area (Table 3).

TABLE 3
GRAVEL PITS

Gravel Pit Location	Status	Within Project area
NE ¼ S12, T110, R49	Active	No
NW ¼ S9, T110, R48	Inactive	No
SW ¼ S8, T111, R47	Active	No
SW ¼ S18, T111, R47	Inactive	No
NW ¼ S36, T111, R48	Inactive	No
SW ¼ S30, T111, R47	Inactive	No

8.1.4 SOIL TYPE

Soils in the Project area primarily consist of a variety of loams, silt loams, silty clay loams and sandy loams derived from underlying glacial tills (USDA, 1959). Most of these soils are conducive to agricultural activities including crop production and livestock grazing (for additional information regarding the agricultural nature of the soils in the Project area, see Section 10.1 and Section 12.0). Some of the soils in the Project area exhibit hydric characteristics; these hydric soils are isolated and generally associated with small prairie pothole-type wetlands or drainageways.

8.1.5 SEISMIC RISKS

The seismic activity in South Dakota is low, especially in the eastern portions of the state. No earthquakes have been reported in Brookings County. Two earthquakes have been recorded approximately 25 miles south of the Project in Moody County. One of these earthquakes occurred in 1935 and registered approximately 2.5 on the Richter scale; the other earthquake was a 3.5 to 4 magnitude earthquake in 1982 (Hammond, 1993).

8.2 FACILITY IMPACTS

8.2.1 POTENTIAL FOR EROSION OR SEDIMENTATION

Possible impacts, depending on remedial actions taken, to geologic, hydrogeologic and soil resources from wind farm development generally are limited to groundwater dewatering as necessary, the interruption of groundwater availability, inaccessibility of sand and aggregate resources, loss of soil resources, erosion and slope stability

8.2.1.1 Groundwater Dewatering

The construction of wind farm facilities can require dewatering of shallow groundwater, especially during excavation for WTG foundations. Construction dewatering temporarily lowers the water table in the immediate area and may temporarily lower nearby surface water elevations depending on the proximity and connectivity of the groundwater and surface water. Discharge of dewatered groundwater to the surface can cause erosion of soils and can impact surface waters with sediment.

Groundwater dewatering is not anticipated to be a major concern with the Project since WTGs are most likely to be placed at higher elevation where the water table tends to be deeper. Should groundwater be encountered that must be dewatered, all necessary permits would be obtained, the duration of dewatering would be minimized to the extent possible and dewatering discharges would be managed to minimize soil erosion and sedimentation of surface waters.

8.2.1.2 Inaccessibility of Sand and Aggregate Resources

Construction of any infrastructure over sand and aggregate resource areas can limit or eliminate the potential for development of such areas. As noted above, there are no active gravel pits affected by the Project.

8.2.1.3 Loss of Soil Resources

Construction of wind turbines and associated access roads alters the ground surface and removes certain soils. These soils may have been used for or suitable for agricultural purposes. Impacts to agricultural soils from the Project are discussed in Section 12.0.

8.2.1.4 Erosion, Slope Stability and Sedimentation

The potential for erosion is often a concern in construction projects. In general, surficial soils on flat areas are less prone to erosion than soils in sloped areas. Construction on or adjacent to steep slope areas can render soils unstable, accelerate natural erosion processes and cause slope failure.

The loamy soils in the Project area are not highly susceptible to erosion; however, care would be taken to avoid or minimize excavation in steep slope areas. Since wind turbines are generally located at higher elevations to maximize exposure to wind, excavation in steep slope areas should be limited to small sections of access roads. Where possible, access roads would be sited to avoid steep slopes. During construction, BMPs would be implemented to ensure that drainage ways and streams are not impacted by sediment runoff from exposed soils during major precipitation events.

The South Dakota Department of Environment and Natural Resources (DENR) has issued a General Storm Water Permit for Construction Activities; an application for coverage under this permit would be needed for the project. One of the conditions of this permit is the development of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would be developed once more detailed information on grading is determined, and would mandate BMPs to control erosion and sedimentation for areas where slopes make soil erosion a particular concern, and any areas where wind erosion may be a concern. BMPs may include silt fencing, erosion control blankets, re-vegetating side slopes, temporary storm water sedimentation ponds or other methods of controlling storm water runoff and minimizing erosion and sedimentation.

9.0 GEOLOGICAL CONSTRAINTS ON DESIGN, CONSTRUCTION AND OPERATION, AND HYDROLOGY (ARSD 20:10:22:14, 20:10:22:15)

There are no geological constraints to construction of the Project. Soil characteristics may change the design requirements of the wind turbine tower foundations. Soil borings have been performed at all turbine locations to insure that the foundation design is suitable for the physical conditions. At the date of publishing this document, a few turbine sites have changed from the location of the original soil boring. Prior to construction, soil borings would be performed at all turbine sites not previously investigated

9.1 EXISTING HYDROLOGY

9.1.1 HYDROGEOLOGY

Groundwater is found at varying depths across the Project area. Buried quaternary sand and gravel outwash deposits (referred to as the Big Sioux Aquifer) comprise the primary aquifer in the Project area; bedrock formations generally are not a major source of groundwater (Schultz, 2004). Regional groundwater flow is generally to the south and west; local groundwater flow is variable and often driven by topography.

9.1.2 SURFACE WATER RESOURCES

The Project area lies entirely within the Upper Big Sioux watershed of the Big Sioux River basin. Within the Project area, surface water flows generally south and west toward the Big Sioux River. Surface water resources within and adjacent to the Project area include Six Mile Creek, Deer Creek and several ephemeral stream tributaries. Six Mile Creek runs through the area just northwest of the Project area, and Deer Creek runs through the area just east and south of the Project area. Six Mile Creek, Deer Creek and the majority of the ephemeral streams have generally been left in their natural, meandering condition. However, in the south central portion of the Project area (township 111N, range 48W, sections 22 and 23), ephemeral streams have been dammed to create ponds. Water resources are shown in Figure 7.

9.1.3 FLOODPLAINS

Federal Emergency Management Agency (FEMA) floodplain mapping shows that the 100-year floodplain of Deer Creek and the ephemeral streams is present in most sections of the Project area. However, the floodplain is generally confined to the streambed and adjacent low-lying areas. The floodplain associated with the ephemeral streams generally ranges from 200 to 500 feet in width. The Deer Creek floodplain ranges from approximately 400 to 1500 feet in width, and is confined to the Project area buffer (FEMA, 1987). Figure 7 identifies FEMA 100-year floodplains in the Study Area.

9.1.4 NPS NATIONWIDE RIVERS INVENTORY

The National Park Service (NPS) describes the Nationwide Rivers Inventory (NRI) as "a listing of free-flowing river segments in the United States that are believed to possess one or more 'outstandingly remarkable' natural or cultural values judged to be of more than local or regional significance. Under a 1979 Presidential directive, and related Council on Environmental Quality (CEQ) procedures, all federal agencies must seek to avoid or mitigate actions that would adversely affect one or more NRI segments." There are no NRI listed rivers within the Project area (NPS, 2004).

9.1.5 IMPAIRED WATERS

The Clean Water Act requires states to publish biannually a list of streams and lakes that are not meeting their designated uses because of excess pollutants. These streams and lakes are considered impaired waters. The list, known as the 303(d) list, is based on violations of water quality standards. The stretch of the upper Big Sioux River located to the southwest of the Project area is on the 303(d) list due to high levels of total suspended solids (TSS), and is considered non-supporting for warm water, semi-permanent fish life. Neither Six Mile Creek nor Deer Creek, which both discharge to this stretch of the upper Big Sioux River, had been assessed as of the writing of this document; therefore, it is not certain whether these streams would be considered impaired waters (SD DENR, 2004).

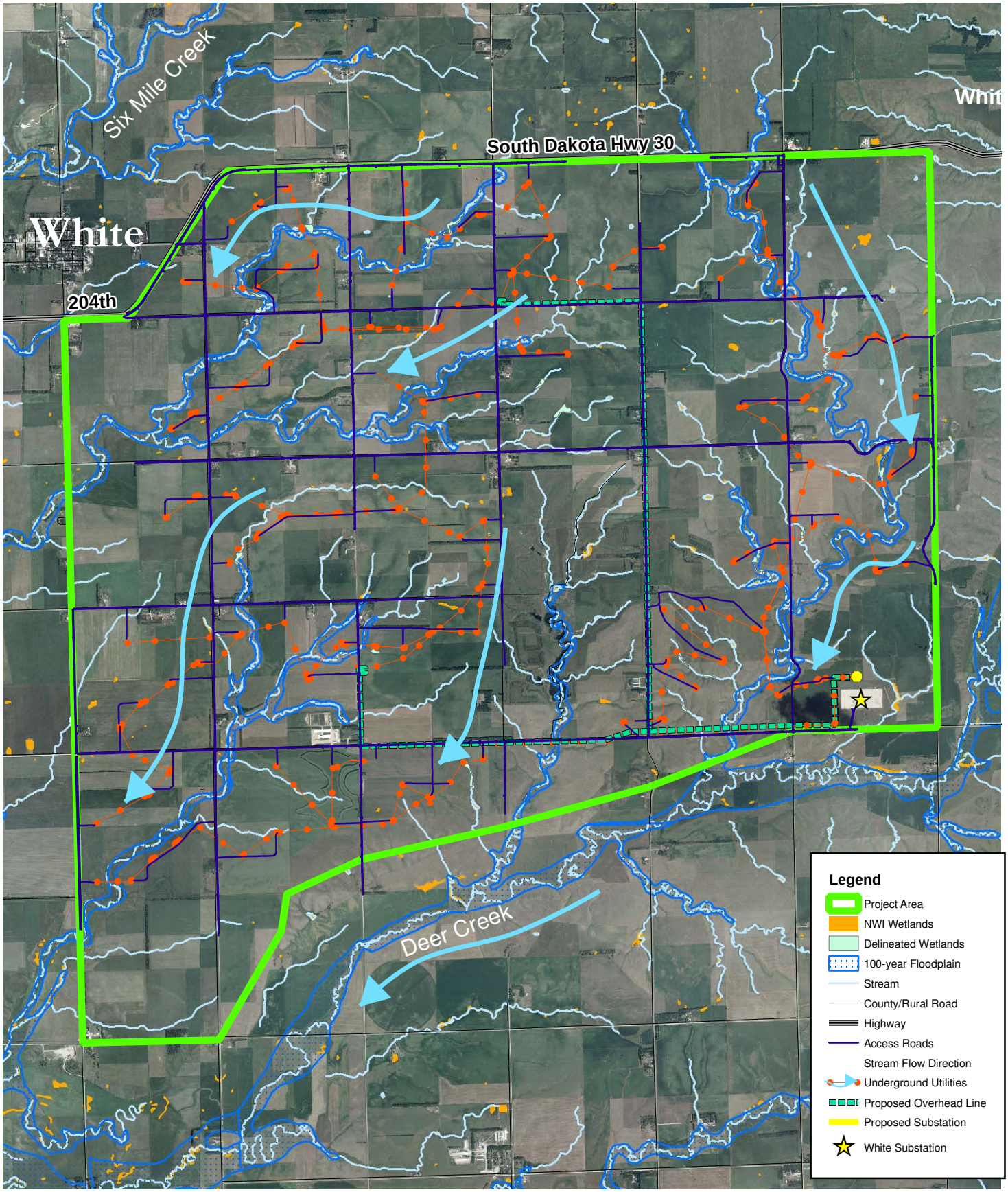

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Figure 7
Water Resources
White Wind Farm
Brookings County, SD

NAVITAS ENERGY

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9.2 FACILITY IMPACTS

9.2.1 EFFECT ON CURRENT OR PLANNED WATER USE

The facility would have no impact on either municipal or private water uses in the facility area. No water storage, reprocessing or cooling is required for either the construction or operation of the facility. No aquifer would be used as a source of potable water supply and no offsite pipelines or channels would be required for water transmission. The facility would not require deep well injection.

The construction of wind farm facilities can interrupt the availability of groundwater through construction dewatering or the acquisition of property that contains water supply wells. Construction dewatering can lower the water table such that nearby water supply wells lose some or all of their capacity.

As noted above, the Project is not anticipated to require major dewatering; therefore, interruption of groundwater availability caused by dewatering is unlikely. Land use for the project is being accomplished through lease agreements with landowners; turbines would be located at least 1,000 feet from any residence. Therefore, no residential wells would be impacted by turbine placement.

In the unlikely event that construction dewatering impacts a water supply well not located at or near a residence (e.g., a livestock water supply well), provisions would be made to ensure that an adequate supply of water is provided until dewatering activities have been completed.

The Project would have no impact on surface water availability or use for communities, agriculture, recreation, fish or wildlife.

9.2.2 SURFACE AND GROUNDWATER IMPACTS

Potential impacts to water resources from the construction and operation of the Project include deterioration of water quality through sedimentation, impacts to drainage patterns, impacts to flood storage areas and increased runoff due to the creation of impervious surfaces. No impacts to groundwater quality are expected from the Project.

9.2.2.1 Deterioration of Water Quality

The excavation and exposure of soils during the construction of wind turbines and access roads could cause sediment runoff during rain events. These sediments would increase the TSS loading in receiving waters. This is of special concern given that the portions of the upper Big Sioux River downstream from the Project area are impaired due to elevated TSS levels.

However, since the Project would disturb more than 1 acre (it is estimated that approximately 105 acres would be disturbed as a result of the construction of turbines, electric feeder system, access roads and Project collection substation), a National Pollution Discharge Elimination System (NPDES) permit would be required. In addition, the South Dakota DENR has issued a General Storm Water Permit for Construction Activities; an application for coverage under this permit would be needed for the project. One of the conditions of this permit is the development of a SWPPP. The SWPPP would mandate BMPs to control erosion and sedimentation. BMPs may include silt fencing, erosion control blankets, temporary storm water sedimentation ponds or other methods of controlling storm water runoff and minimizing sedimentation (SD DENR, 2005). In addition, Brookings County would require a soil erosion and sediment control plan.

9.2.2.2 Impacts to Drainage Patterns

In general, because WTGs would be located at higher elevations within the Project area to maximize wind exposure, impacts to ephemeral streams and drainage ways are not anticipated from the turbine sites. There is the potential for access roads to impact ephemeral streams and drainage ways; however, roads have been sited to avoid crossing or paralleling streams. Where stream/drainage way crossings cannot be avoided, culverts (concrete spans) would be placed to maintain the free flow of water.

9.2.2.3 Impacts to Flood Storage Areas

In natural systems, floodplains serve several functions, including:

- Storing excess water during high flow/high runoff periods;
- Moderating the release of water during high flow/high runoff periods;
- Reducing flow velocity;
- Filtering out sediments and other pollutants.

The placement of fill into floodplains reduces the effectiveness of these functions. As noted previously, WTGs would be located at higher elevations, and should not impact designated floodplains. To the extent possible, access roads have been placed to avoid floodplains. If a situation arises where floodplain impacts cannot be avoided, a floodplain analysis would be conducted to quantify impacts and determine appropriate mitigation requirements.

9.2.2.4 Increased Runoff

The creation of impervious surfaces reduces the capacity of an area to absorb precipitation into the soil and tends to increase the volume and rate of storm water runoff. The Project would create up to 105 acres of impermeable surface through the construction of turbine pads, access roads and the Project Substation. Although the access roads and Project Substation would be constructed of compacted gravel and would not be paved, the level of compaction generally inhibits infiltration and increases runoff.

The 105 acres of new impervious surface represents less than 0.5 percent of the total acreage in the Project area; therefore, the project is not expected to cause major changes in runoff patterns or volume. However, as noted above, appropriate storm water management BMPs would be implemented during the construction and operation of the wind farm. These BMPs are anticipated to adequately mitigate the effects of any increases in runoff volume due to the increase in impervious surface.

10.0 EFFECT ON TERRESTRIAL ECOSYSTEMS (ARSD 20:10:22:16)

10.1 EXISTING TERRESTRIAL ECOSYSTEM

10.1.1 NATURAL COMMUNITIES

10.1.1.1 Vegetation

Vegetation Resources, along with other biological resources are discussed in detail in the Phase I Screening Report and FWS PII Score (Appendix A).

The majority of the Project area is in cultivated cropland (11,078 acres). In addition to cultivated cropland, other types of vegetative cover in the Project area were: planted grassland (i.e., Conservation Reserve Program, 302 acres), disturbed grassland (4,283 acres), drainages (762 acres), pond (46 acres), riparian woodland (9 acres) and developed/woodlot (1,065 acres). Figure 8 shows the vegetation of the Project area (Derby, 2005). A more detailed description of the vegetation resources within the Project area follows (note that wetlands are discussed in a separate section).

10.1.1.2 Cropland

The majority (63 percent) of the Project area is cropland (Derby). In Brookings County, 65 percent of the land area in 2002 was cropland, with soybeans and corn being the most common crops (AGSS, 2002). Other common cultivated crops included wheat and oats. Cultivated cropland decreased slightly (by 2,255 acres) in Brookings County from 1997 to 2002 (AGSS, 1997). Specific acreages of different croplands within the Project area are not available, and change from year to year.

10.1.1.3 Grassland

Grassland covers approximately 24 percent of the Project area. Areas of what is classified as "disturbed grasslands" include what appeared during the site visit to be untilled areas (primarily relatively steep areas), as well as areas that may have been tilled at one time but have since reverted to grassland. In both cases, smooth brome grass has invaded the area and is the dominant species. The planted grassland land cover is commonly grazed or hayed annually (Derby, 2005).

Some areas of cropland in the Project area have been enrolled in the Conservation Reserve Program (CRP). CRP land is removed from crop production for a specific period (usually 10 years) and is planted with cover designed to conserve soil and water. Haying and livestock grazing are not permitted on CRP land unless specifically allowed during droughts. In Brookings County, approximately 43,000 acres (8.5 percent of the County) was enrolled in the CRP (FSA, 2005). No areas of native grasslands were noted during the site visit; although the disturbed grasslands may contain some native sod areas that are heavily encroached upon by smooth brome grass (Derby, 2005). The CRP program allows for removing land from contract, without penalty, for wind energy. The Project would have temporary impacts to 35.6 acres of CRP land, and would permanently convert 5.1 acres of CRP land to wind energy uses.

The USFWS has approximately 480 acres of grasslands easements within the Project area (USFWS, 2005 Easement Map). The Project would have temporary impacts to 37.3 acres of land under USFWS grassland easements, and would permanently convert 4.0 acres currently under USFWS grassland easements to wind energy use. The USFWS is responsible for the review and regulation of grassland easement impacts, and the Applicant would coordinate with this agency to determine appropriate mitigation.

10.1.1.4 Forest/Woodlot

Shelterbelts and small woodlots are associated with farm buildings and cropped fields throughout the Project area. Trees are planted in cultivated areas to reduce wind erosion and provide wildlife habitat. A variety of native and non-native shrubs and trees are used for these plantings, according to the Brookings County Farm Service Agency (FSA, 2005). In the Project area, the forest/woodlot cover type accounts for about 6 percent of the total area (Derby, 2005).

10.1.1.5 Riparian Areas

Forested riparian areas account for less than 1 percent of the Project area. Riparian habitats are important to wildlife because they generally have relatively high plant species diversity and high vertical habitat diversity. Most of the riparian areas within the Project area are limited to narrow areas bordering swales, drainage ways and ditches (Derby, 2005).

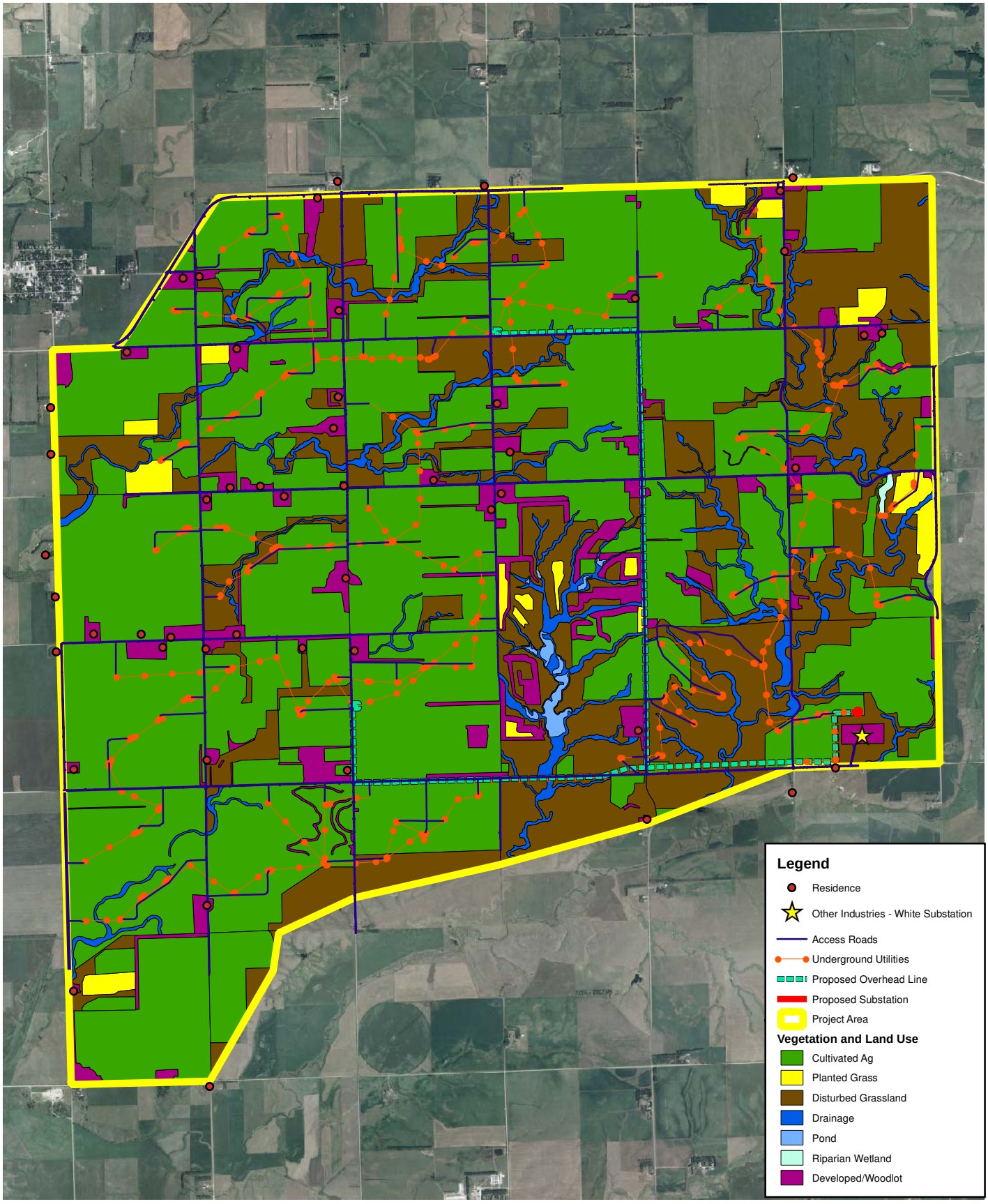

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Figure 8
Vegetation and Land Use
White Wind Farm
Brookings County, SD

NAVITAS ENERGY

HDR

10.1.1.6 Noxious Weeds

Noxious weeds (as designated by the Code of Federal Regulations, Title 7, Section 360.200 and South Dakota Codified Laws 38-22) are regulated by state and Federal rules and regulations designed to stop the spread of plants that are detrimental to the environment, crops, livestock and/or public health.

Table 4 lists state and local noxious weeds that may be found within the Project area (species that have been found in Brookings County).

TABLE 4
NOXIOUS WEEDS

Category	Noxious Weed Species
State Listed	*Cirsium arvense* (Canada thistle) *Convolvulus arvensis* (field bindweed) *Euphorbia esula* (leafy spurge) *Lythrum salicaria* (purple loosestrife) *Sonchus arvensis* (perennial sow thistle)
Local Listed	*Artemisia absinthium* (absinth wormwood) *Carduus acanthoides* (plumeless thistle) *Carduus nutans* (musk thistle) *Cirsium vulgare* (bull thistle)

10.1.1.7 Wetlands

This section generally describes the wetland resources within the Project area. The area of potential impact for wetlands is considered the disturbed area within the Project. Wetlands perform several important functions within a landscape, including flood attenuation, ground water recharge, water quality protection and wildlife habitat production. In eastern South Dakota (including the Project area) the prairie pothole wetlands are particularly integral in providing waterfowl breeding and foraging habitat. Wetland resources for the Project area were identified by reviewing USFWS National Wetland Inventory (NWI) mapping (USFWS, 2005, National Wetlands Inventory). NWI Wetlands are shown in Figure 7.

10.1.1.8 Regulatory Environment

Wetlands are defined by the United State Army Corps of Engineers (USACE) as "Waters of the U.S." and are subject to jurisdiction under Section 404 of the Clean Water Act (1973). Waters of the U.S. include both wetlands and non-wetlands that meet USACE criteria. USACE has determined that a jurisdictional wetland must have a predominance of hydrophytic vegetation, hydric soil and wetland hydrology. Any impacts to jurisdictional wetlands would be reviewed and permitted through the Section 404 Wetland permit process.

The Natural Resource Conservation Service (NRCS) oversees the Wetland Reserve Program where landowners sell conservation easements or enter into a cost-share restoration agreement with the U.S. Department of Agriculture (USDA). Any impacts to wetlands could affect farm benefits to landowners. The Applicant has notified the NRCS Field Office of the proposed project location and activity. The NRCS comments did not address wetland impacts.

The USFWS has been purchasing wetland easements in the prairie pothole region since 1958 and grassland easements (see Section 10.1.1.10) since 1989 as an approach towards waterfowl habitat management. These easements provide perpetual protection of the wetlands and grasslands within the easement lands. There are no wetland easements within the Project area.

10.1.1.9 Wetland Resources

Within the Project area, there are 151 wetlands totaling 72.8 acres; palustrine aquatic bed (48 percent) and palustrine emergent (47 percent) type wetlands make up the majority of the area (USFWS, 2005, National Wetlands Inventory). Table 5 shows the wetland resources for the Project site.

TABLE 5
NWI WETLANDS

	Project Site	
Wetland Type	**No. of Basins**	**Area (Acres)**
Lacustrine	0	0
Palustrine		
Aquatic bed	86	34.69
Emergent	62	34.26
Forested	2	3.11
Scrub/shrub	1	0.66
Unconsolidated bottom	0	0
Total	**151**	**72.71**

10.1.1.10 Wildlife

In general, species present within the Project area are those found in agricultural landscapes, pasture grasslands and wetland habitats. Common mammals for these habitats include raccoon, mink, skunk, weasel, white-tailed deer, coyote, red fox, badger, porcupine and rabbit. Common birds include songbirds, waterfowl and game birds such as pheasant and turkey (a list of wildlife species observed during the site visit is attached as Appendix B). Additionally, there are approximately 480 acres of USFWS grassland easements within the project site (USFWS, 2005, Map of Easements). A summary of the wildlife resources detailed within the Phase I Screening Report and USFWS PII Score report (Appendix A) follows.

10.1.1.11 Migratory Birds

The Project area is located within the Prairie Pothole Region (that portion of western Canada and the western United States characterized by grassland covered with large shallow depressions, or "potholes", created long ago by retreating glaciers that have subsequently filled with water) and as such contains important habitat for waterfowl production. The 1918 Migratory Bird Treaty Act protects most species of migratory birds. The Project area contains both wetland and upland bird habitat. However, a field review concluded that the Project area contains only limited migratory bird stopover habitat, especially compared to surrounding areas in the Prairie Pothole Region. There are no topographic features, such as mountain passes or large rivers, which would serve to funnel or direct migratory paths to the Project area. The few scattered wetlands and ponds likely provide habitat for local waterfowl populations (Derby, 2005).

10.1.1.12 Raptors

Although no cliff or rock outcrops were identified, potential raptor nesting sites in the form of trees (scattered and in planted shelterbelts and woodlots) occur throughout the Project area. The topography of the site, which consists of flat to rolling areas, is not expected to support dense raptor populations, due to a lack of steep ridges and rims. The 100- to 200-foot moderate slope along Deer Creek in the far eastern portion of the site does not have a steeply defined rim and would not be expected to attract raptors due to updrafts (Derby, 2005).

The site visit did not show evidence of a high density of above ground nesting raptors, although several small non-active stick nests were noted. The nests likely were associated with Swainson's hawks (*Buteo swainsoni*) and/or red-tailed hawks (*Buteo jamaicensis*). No large stick nests, like those associated with bald eagles, were noted during the site visit. Although not observed during field visits, other raptors that may be present in the Project area include: American kestrel (*Falco sparverius*), great-horned owl (*Bubo virginianus*), bald eagles (*Haliaeetus leucocephalus*), northern harrier (*Circus cyaneus*), Cooper's hawk (*Accipiter cooperi*), sharp-shinned hawk (*Accipiter striatus*), turkey vulture (*Cathartes aura*), ferruginous hawk (*Buteo regalis*), rough-legged hawk (*Buteo lagopus*), Osprey (*Pandion haliaetus*), peregrine falcon (*Falco peregrinus*), goshawk *(Accipiter gentiles)* and broad winged hawk (*Buteo platypterus*) (Derby, 2005).

10.1.1.13 Bats

Bats are a species of concern in proposed wind farm projects, due to the potential for increased bat mortality associated with wind turbines. The site visit did find potential roosting habitat (trees and buildings) within the project site. No caves were noted on the site visit or by consulted agency personnel. No bats were directly observed during the site visit, but the report concluded that bats likely to be found within the Project area include the big brown bat (*Eptesicus fuscus*), hoary bat

(*Lasiurus cinereus*), eastern red bat (*Lasiurus borealis*), little brown bat (*Myotis lucifugus*), northern myotis (*Myotis septentrionalis*) and silver-haired bat (*Lasionycteris noctivagans*) (Derby, 2005).

A site review of the Project area was unable to conclusively determine whether the Project is within a bat migration corridor. Topographic features, such as steep, well defined ridges and passes that may tend to funnel migrating bats are absent from the proposed project, potentially reduce the possibility for high concentrations of migrating bats (Derby, 2005).

10.1.2 SENSITIVE SPECIES

The USFWS Office in Pierre, South Dakota identified two federally-listed threatened species, the Bald Eagle (Haliaeetus leucocephalus) and the Western Prairie Fringed Orchid (Platanthera praeclara), and one federally-listed endangered species, the Topeka Shiner (Notropis topeka) (USFWS Response Letter, November 19, 2004, Appendix D). The South Dakota Department of Game Fish and Parks (GFP) identified a state-listed threatened species, the northern red-belly dace (*Phoxinus eos*) that could occur within the Project area. The GFP also indicated that whooping cranes (*Grus americana*), a federally listed endangered species, may pass through the Project area (GFP Response Letter, November 12, 2004, Appendix D).

Since these species of concern could potentially be within the proposed project site, further study was needed to determine the potential for adverse impacts because of construction of the project. As a part of the biological survey conducted by Derby, the potential impacts to these threatened and endangered species was analyzed. The results of the analysis are summarized below.

10.1.2.1 Bald Eagle

South Dakota is home to bald eagles throughout the year. Wintering bald eagles are often associated with lakes, rivers and reservoirs where they feed primarily on fish. During migration and winter periods, they may also be found in areas away from major rivers if sufficient food is available.

Bald eagles nest in areas with mature forest, typically along major waterways, lakes and reservoirs (GFP, 2005). However, with increasing bald eagle populations, nesting eagles are also being found in areas away from "major" water bodies. The USFWS and GFP both stated in their correspondence that there are no known bald eagle nests in the vicinity of the Project, but that current surveys have not been completed. There are no large water bodies in the Project area, and limited potential nesting habitat is present within the Study Area in the form of scattered mature cottonwood trees. A site visit to the Project area in May 2005 did not observe any potential bald eagle nests in mature trees. Although there is no evidence of nesting bald eagles in the Project area, bald eagles may occur within the area, particularly during migration (Derby, 2005).

10.1.2.2 Whooping Crane

The whooping crane is an endangered bird with a total population of over 200 birds as of March 2005. Whooping cranes typically migrate from their breeding grounds in Wood Buffalo National Park, Canada to their wintering areas in Aransas National Wildlife Refuge, Texas. During the migration, most birds pass through central South Dakota. Most documented observations of whooping cranes within South Dakota have occurred along the Missouri River valley. Although there have been confirmed observations in other areas of South Dakota, none have been documented in Brookings County. The Project area contains very little potential migratory habitat for whooping cranes (e.g., palustrine wetlands, wet meadows) (Derby, 2005).

10.1.2.3 Topeka Shiner

The Topeka shiner 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. Most streams containing Topeka shiners are perennial, but some may be ephemeral. In the small ephemeral streams, the shiners would survive in small pools maintained by groundwater seepage (GFP, 2005).

The Topeka shiner is known to occupy numerous small streams within eastern South Dakota, including Deer Creek, which runs through an area just east of the Project area and Six-Mile Creek, which run north of the City of White.

10.1.2.4 Northern Redbelly Dace

Northern redbelly dace is a minnow found in numerous drainages across the northern U.S. and southern Canada. It is generally found in streams and ponds with cool, clear, sometimes stained water with sand or silt bottoms, in habitats similar to Topeka shiner's habitats. The dace is known to occur within Deer Creek, which crosses the Project area (GFP, 2005).

10.1.2.5 Western Prairie Fringed Orchid

The Western prairie fringed orchid is restricted to areas west of the Mississippi and is currently found in Iowa, Kansas, Minnesota, Nebraska, North Dakota and Manitoba, Canada; the orchid has not been recently documented in South Dakota. Where they do occur, Western prairie fringed orchids are associated primarily with intact, native tall grass prairie. They have, however, been found in roadside ditches and reclaimed grasslands. Potential habitat within these grassland areas includes mesic upland prairies (moist areas in upland sites), wet prairies, sedge meadows, sub-irrigated prairies and swales in sand dune complexes (Derby, 2005).

Figure 8 identifies areas of tilled agriculture, planted grassland (e.g. CRP), rural developed area, disturbed grassland, drainages (perennial and ephemeral) and other vegetation/land use types.

Western Ecosystems Technology, Inc. (WEST) defined potential orchid habitat as wet areas within grasslands; therefore the areas identified as drainages contain potential orchid habitat. The wetter portions of these drainages vary from larger wetlands along ephemeral streams, to pockets of wet, hummock type areas, to small wet benches above perennial streams. In most areas, it is likely that potential habitat would be strongly impacted by past and current haying, herbicide spraying and occasional tilling. This fact, combined with the fact that there are no known populations of Western prairie fringed orchid in South Dakota, makes it unlikely that the orchid occurs within the project site (Derby, 2005).

10.2 IMPACTS TO TERRESTRIAL SYSTEMS

10.2.1.1 Vegetation

Any unmitigated loss of native or unique vegetation or uncontrolled introduction of noxious weeds could result in an impact to vegetation resources.

Construction of the Project would result in temporary and permanent impacts to existing vegetation within the Project area (Table 6). Direct permanent impacts would occur due to construction of the access roads and wind turbines, and would be confined mainly to cultivated areas. These impacts would result in a loss of production of crops and pasture grasses. Other indirect impacts could include the spread of noxious weed species resulting from construction equipment introducing seeds into new areas or erosion or sedimentation due to clearing ground in the construction areas. Vegetation communities most sensitive to disturbance are native prairies (not present within the Project area), wetlands and natural riparian woodlands. Turbines and access road locations have been sited to avoid sensitive habitats to the extent possible. Where avoidance is not possible, siting would attempt to minimize impacts to these sensitive habitats. Temporary impacts would be mitigated through BMPs such as re-vegetation, erosion control devices and dust control measures on new road construction. These measures would minimize any temporary impacts to vegetative communities adjacent to the turbine and road sites. Noxious weeds would be controlled using weed control measures.

The Project would not result in any major clearing activities. Turbines and access roads would be sited in open fields. Some minor clearing of brush may be required for collection lines and access roads.

No unique native vegetative habitats would be affected by the project. Direct and indirect impacts to undisturbed grasslands and woodlands would be avoided to the greatest extent possible. When impacts are unavoidable, they would be minimized and mitigated by the use of BMPs, noxious weed control and re-vegetation.

TABLE 6
ACREAGE OF DIRECT OR INDIRECT IMPACTS WITHIN EACH VEGETATION CLASS

Land Cover Category	Impacts	Turbine Pads/ Staging	Access Roads	Underground Cable	Overhead Transmission	Substation	Subtotal by Category
Agriculture	Temporary	322.2	100.1	95.3	12.78	0.91	531.29
	Permanent	20.1	52.9	0.00	0.09	0.75	73.84
Planted Grassland (CRP)	Temporary	9.1	3.2	1.00	0.00	0.00	13.3
	Permanent	0.6	1.7	0.00	0.00	0.00	2.3
Development/ Woodlot	Temporary	3.7	5.8	2.00	0.86	0.00	12.36
	Permanent	0.15	3.6	0.00	0.01	0.00	3.76
Disturbed Grassland	Temporary	3.26	21.0	31.5	7.00	0.00	62.76
	Permanent	1.18	11.3	0.00	0.05	0.00	12.53
Drainage	Temporary	0.7	0.4	2.4	0.76	0.00	4.26
	Permanent	0.00	0.6	0.00	0.01	0.00	0.61
Riparian Wetland	Temporary	0.7	0.2	0.08	0.00	0.00	0.98
	Permanent	0.00	0.00	0.00	0.00	0.00	0.00
Delineated Wetlands	Temporary	0.31	0.00	0.00	0.01	0.00	0.32
	Permanent	0.00	0.00	0.00	0.00	0.00	0.00
NWI Wetlands	Temporary	0.37	0.00	0.00	0.05	0.00	0.42
	Permanent	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal	Temporary	340.34	130.7	132.28	21.46	0.91	**625.69**
Subtotal	Permanent	22.03	70.1	0.00	0.16	0.75	**93.04**

10.2.1.2 Wetlands

Impacts to wetlands resources could occur by directly filling wetlands due to construction of the project, or by otherwise negatively altering their functions and values. Wetland resources in the Project area were surveyed in August 2005. Surveys were conducted within 200-500 feet of all proposed WTG locations, access roads and underground electric lines. The majority of wetlands present within the Project area are seepage-fed drainages, with some isolated pothole wetlands interspersed. Figure 7 shows the location of the proposed Project facilities in relation to identified wetlands. The results of the survey were provided to the USACE-Omaha Office for the purpose of Section 404 compliance with the Clean Water Act. In addition, certain project components were moved to avoid affecting wetlands within the Project area.

Because wetlands within the Project area are relatively small and widely scattered, the Applicant anticipates that the Project would be able to avoid most wetland areas. WTGs would be constructed in the upland hill areas, avoiding the low-lying wetlands. Wetland areas would also be avoided to the extent possible when positioning access roads and feeder lines. Because most wetlands are small and scattered, the Applicant anticipates that overhead feeder lines would be able to span wetlands without placing structures within the wetlands. To further protect wetlands, BMPs for sediment and erosion control would be implemented. In order to minimize contamination of wetlands due to accidental spilling of fuels or other hazardous substances, all construction equipment would be equipped with spill cleanup kits. Refueling would take place away from wetlands or drainage areas, in secure areas.

The Applicant would work with the jurisdictional agencies (USACE and/or USFWS) to determine the best ways to minimize the impacts and create appropriate mitigation measures for any unavoidable wetland impacts.

10.2.1.3 Wildlife

Direct and indirect impacts to wildlife could occur through loss of or change to habitat because of construction of the proposed project. Direct impacts to wildlife populations could occur due to mortality resulting from bird and bat collisions with wind turbines.

Construction activities that remove vegetation and disturb soil could cause some small wildlife species to be exposed to predators or displaced. Permanent habitat loss due to construction of WTGs, the Project collection substation and access roads would be minimal, restricted to localized areas primarily within cultivated fields. Temporary impacts to wildlife habitat adjacent to the structures would be mitigated through re-vegetation.

Short-term changes in habitat, such as construction noise, and increased presence of vehicles and humans, would be localized and minimal. Vehicles could disturb or destroy ground-nesting birds and animals during the breeding season. Any potential losses are not expected to impact populations.

The literature on long-term effects of wind turbines on breeding habitat shows that although there appears to be a decrease in breeding songbird density in the immediate vicinity of turbines, broader scale changes were absent.

Waste containment measures would be taken during construction in order to minimize the production of loose trash that could attract scavengers such as raccoons and ravens. By removing waste from the Project area, impacts to nesting species due to increased presence of scavengers would be avoided.

Any attraction of scavengers to the area would be of short duration and would not be expected to impact other populations.

10.2.1.4 Bird and Bat Mortality

The Phase I Screening and USFWS PII Score (Appendix A) conducted an extensive literature review detailing the relationship between wind farms and bird and bat fatalities. A summary of their conclusions follows.

A study of raptor fatalities at the nearby 354-turbine Buffalo Ridge wind farm in southwestern Minnesota (with similar land use and topography to the White Wind Farm project site) documented one raptor fatality, a red-tailed hawk, during 4 years of monitoring, from 1996 to 1999. Studies of migratory and song bird fatalities at the 354-turbine Buffalo Ridge wind farm estimates a fatality rate of 0.98-4.45 fatalities/turbine/year. It is reasonable to expect similar raptor and songbird mortality at the proposed White Wind Farm (Derby, 2005).

Bat fatalities can occur because of collisions with wind turbines. Derby researched the literature and reported in the biological resources report that estimates of bat mortality at wind farms in the United States through 2001 ranged from 0.07 – 10.0 fatalities/turbine/year. Derby noted that the majority of the species affected by the turbines are migratory bats that migrate for long distances between summer and winter habitats (Derby, 2005).

As noted above, there do not appear to be topographic features within the Project area that would funnel high densities of migrating bats through the site. However, bat fatalities were documented within the Buffalo Ridge area, and it is reasonable to expect similar bat fatality rates at the proposed White Wind Farm site (Derby, 2005).

10.2.1.5 Potential Impact Index

As recommended by the USFWS 2003 publication, *Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines,* Derby filled out a Potential Impact Index (PII) worksheet as part of the biological resources report (Appendix A). The PII is designed to analyze the suitability of a proposed wind farm site with regard to potential impacts to wildlife. The PII compares a reference site, chosen for relatively high potential for negative impacts to wildlife resulting from construction of a wind farm, to the proposed project site. The report compared the proposed project site to a reference area, the Oakwood Lakes State Park approximately 15 miles west of the Project area. The PII score for the reference site was 197; the score for the proposed project site was 131. These results show that the potential for adversely affecting wildlife is substantially lower at the proposed site than at comparable, adjacent areas of higher quality habitat like those found in the Oakwood Lakes State Park (Derby, 2005).

A variety of measures would be used to avoid and minimize bat and bird fatalities that may result from the Project. The Project would use solid towers for WTGs instead of the lattice tower structures (lattice towers become preferred nesting sites). Strobe lights that are less attractive to night-flying birds would be installed. The minimum lighting required by the FAA would be used on the turbines. These measures would minimize the amount of wildlife, especially raptor, fatalities resulting from collisions with the wind turbines. The Applicant would construct any overhead power lines required for the project in accordance with the current guidelines for preventing raptor electrocutions, (APLIC, 1996). If impacts to wildlife habitat occur within USFWS easements, the Applicant would coordinate with the agency to determine the best method of mitigation.

The Applicant has agreed to complete avian baseline and post-construction monitoring to determine avian use of the Project area before and after project implementation, and also to determine mortality rates associated with the implementation of the project. The methodology of these studies has been reviewed and approved by Western and the USFWS.

10.2.1.6 Sensitive Species

Although there are no known bald eagle nests within, or near, the Project area, it is possible that bald eagles occur within the Project area. However, there are no documented bald eagle fatalities at wind power facilities, even when bald eagles are known to nest within relative close proximity of wind farms. No whooping cranes have been documented within Brookings County, and the Project area contains very little potential migratory habitat for whooping cranes. Both bald eagles and whooping cranes tend to fly well above the height of wind turbines when migrating. Therefore, impacts to bald eagles and whooping cranes from the Project are unlikely.

Direct impacts on the Topeka shiner and redbelly dace would be unlikely because turbines would be placed in upland areas. However, to minimize indirect impacts due to stream crossings or increased sedimentation from construction, the USFWS recommends further coordination for guidance in developing BMPs. Western, with input from the Applicant, would coordinate with the USFWS regarding this issue.

No occurrences of the Western prairie fringed orchid have been observed recently within South Dakota, and the May 2005 site visit did not document any of the species. Since most of the areas that could be potential orchid habitat (drainage ways) are likely currently disturbed, and turbines and roadways would be placed generally in uplands out of the drainage ways, impacts to the orchid from the proposed project are unlikely. The Applicant would comply with the USFWS recommendation for site-specific surveys for this species if turbines, roads or power lines placed in potential orchid habitat.

11.0 EFFECT ON AQUATIC ECOSYSTEMS (ARSD 20:10:22:17)

11.1 EXISTING AQUATIC ECOSYSTEM

Surface waters are described in Section 9.1, Existing Hydrology, Surface Water Resources, and shown on Figure 7. The Project area lies entirely within the Upper Big Sioux watershed of the Big Sioux River basin. Within the Project area, surface water flows generally south and west toward the Big Sioux River. Surface water resources within and adjacent to the Project area include Six Mile Creek, Deer Creek and several ephemeral stream tributaries. Six Mile Creek runs through the area just northwest of the Project area, and Deer Creek runs through the area just east and south of the Project area. Six Mile Creek, Deer Creek and the majority of the ephemeral streams have generally been left in their natural, meandering condition. However, in the south central portion of the Project area (township 111N, range 48W, sections 22 and 23), ephemeral streams have been dammed to create ponds. As noted in Section 10.1, the Topeka shiner and the northern redbelly dace (special status species) are know to inhabit Project streams.

As described in Section 10.1.1, there are 151 wetlands in the Project area, totaling approximately 73 acres; palustrine aquatic bed (48 percent) and palustrine emergent (47 percent) wetland types comprise the majority of the wetlands in the Project area. The dominant vegetation found in the wetlands and drainageways consists of prairie cordgrass (*Spartina pectinata*); other non-dominant species include water smartweed (*Polygonum amphibium*), cattail (*Typha spp.*) and green bulrush (*Scirpus atrovirens*).

11.2 IMPACTS TO AQUATIC ECOSYSTEMS AND MITIGATION

The primary potential for impact to aquatic ecosystems would be from increased sedimentation or increased total suspended solids due to soil erosion from the construction sites of the Project. In general, surficial soils on flat areas are less prone to erosion than soils in sloped areas. Construction on or adjacent to steep slope areas can render soils unstable, accelerate natural erosion processes and cause slope failure.

The loamy soils in the Project area are not highly susceptible to erosion; however, care should be taken to avoid or minimize excavation in steep slope areas. Since wind turbines are generally located at higher elevations to maximize exposure to wind, excavation in steep slope areas should be limited to small sections of access roads. Where possible, access roads would be sited to avoid steep slopes. During construction, BMPs would be implemented to ensure that drainage ways and streams are not impacted by sediment runoff from exposed soils during major precipitation events. The South Dakota DENR has issued a General Storm Water Permit for Construction Activities similar to the proposed project; an application for coverage under this permit would be needed for the project. One

of the conditions of this permit is the development of a SWPPP. The SWPPP would be developed once more detailed information on grading is determined, and would mandate BMPs to control erosion and sedimentation for areas where slopes make soil erosion a particular concern, and any areas where wind erosion may be a concern. BMPs may include silt fencing, erosion control blankets, re-vegetating side slopes, temporary storm water sedimentation ponds or other methods of controlling storm water runoff and minimizing erosion and sedimentation.

As described in Section 11.2, impacts on wetlands would be minimal, because WTGs would be constructed in the upland hill areas and wetlands would be avoided to the extent possible when positioning access roads and collection feeder lines.

12.0 LAND USE (ARSD 20:10:22:18)

12.1 EXISTING LAND USE

The evaluation of land use focuses on the Project area, but includes a discussion on land use adjacent to the Project area and in Brookings County to establish a regional setting for the Project.
The predominant land use within the Project area is agricultural - a combination of cultivated row crops and pastureland (Derby, 2005). Soils in the Project area consist of a variety of loams, silt loams, silty clay loams and sandy loams derived from underlying glacial tills that are considered rich agricultural soils. The majority of the land, 66.4 percent, within the Project area is considered prime farmland. An additional 7 percent is considered prime farmland if drained (USDA, 2003). Federal regulations define prime farmland as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops and is available for these uses" [7 CFR, 657.5 (a) (1)].

Other land uses within the Project area are scattered rural residences, farmsteads, transmission lines and the White Substation (Figure 8). The entire Project area is zoned as Agricultural by Brookings County. The City of White (population 530) is located just outside the Project area.

There are no irrigated lands, no undisturbed native grassland, no public, commercial or institutional land uses, no municipal water supply or water sources for rural water districts, no concentrated residential development (the city of White is just outside the Project area) and no other major industrial land uses (other than Western's existing White Substation) in the Project area. There are no other noise sensitive land uses, other than the residential and farmstead properties, which are addressed in Section 12.2.2 and are protected by setback requirements and noise standards established by the Brookings County Zoning Ordinances.

12.2 LAND USE IMPACTS

12.2.1 DISPLACEMENT

Based upon the proposed project layout of WTGs, access roads, collector lines, collector substation and the interconnection facilities (Figure 3), there would be no displacement of residences or businesses.

12.2.2 NOISE

Noise is defined as unwanted sound. It may be comprised of a variety of sounds of different intensities, across the entire frequency spectrum. Noise concerns for this project may be associated with both the construction and operation of the wind turbines and substation. When in motion, the wind turbines emit a perceptible sound. The level of this noise varies with the speed of the turbine and the distance of the listener from the turbine. On relatively windy days, the turbines create more noise; however, the ambient or natural wind noise level tends to override the turbine noise as distance from the turbines increases. A small project substation would be located adjacent to the existing Western substation. It is not anticipated that the project substation would noticeably increase the noise levels in this area.

Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight." The A-weighted decibel (dBA) scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA. A noise level change of 3 dBA is barely perceptible to average human hearing. A 5-dBA change in noise level, however, is clearly noticeable. A 10-dBA change in noise level is perceived as a doubling or halving of noise loudness, while a 20-dBA change is considered a dramatic change in loudness. Table 7 shows noise levels associated with common, everyday sources, and places the magnitude of noise levels discussed here in context.

TABLE 7
COMMON NOISE SOURCES AND LEVELS

Sound Pressure Level (dBA)	Typical Sources
120	Jet aircraft takeoff at 100 feet
110	Same aircraft at 400 feet
90	Motorcycle at 25 feet
80	Garbage disposal
70	City street corner
60	Conversational Speech
50	Typical office
40	Living room (without TV)
30	Quiet bedroom at night

Source: Environmental Impact Analysis Handbook, ed., Rau and Wooten, 1980

The primary land use in the Project area is rural agricultural land. Average noise levels in these areas are typically in the 30 to 40 dBA range and are considered acceptable for residential land use activities. Ambient noise in rural areas is commonly made up of rustling vegetation and infrequent vehicle pass-bys. Higher ambient noise levels, typically 40 to 55 dBA, are expected near roadways, such as State Highway 30 and more urban areas, such as the nearby town of White, South Dakota.

The Brookings County Zoning Ordinance Section 1212, Wind Energy System (WES) Requirements (Appendix E), subsection D-12 Noise, states that "noise levels shall not exceed 50 dBA, including constructive interference effects at (See recent change in ordinance) existing off-site residences, businesses and public buildings." (Brookings County Planning and Zoning, 2005)

12.2.2.1 Noise Impacts

The wind turbines would create sources of additional noise. Sound is generated from the wind turbine at points near the hub or nacelle (located approximately 80 meters above the ground) and from the blade rotation itself. To predict future noise levels at residences in the Project area, Gamesa Wind 2.0 MW WTGs were modeled using a 3-dimensional acoustical analysis software program CadnaA version 3.5. The analysis assumed a sound power level of 105.3 dBA or an approximate sound pressure level of 95 dBA at 3 feet from the nacelle for these turbines, based on data provided by Gamesa Wind for turbines operating at wind velocities of 7 meters per second (m/s) or greater as measured 10 meters above the ground. This sound power level is consistent with turbines of similar size and technology currently used in the United States.

The noise levels predicted for the project were quantified using an hourly equivalent noise level (Leqh) descriptor to draw comparison to the Brookings County recommended outdoor noise level for off-site

residences, businesses and public buildings of 50 dBA, at the residence. The model predicted hourly noise levels at residences in the Project area below 45 dBA. The noise levels depend on the distance from WTG to the residences. The predicted distance from a WTG to the 50 dBA noise contour is approximately 500 feet. Under the current WTG siting plan, it is not anticipated that noise levels would exceed the 50-dBA limit at offsite receptors under normal operating conditions. Variability in the WTG generated noise levels would be dependent on meteorological conditions.

Wind turbines also produce a dominant tone from the aerodynamic motion of the blades as they pass the turbine tower. Kaiser-Wilhelm-Koog documented the dominant frequency as 1238 Hertz (Hz) for the 2.0 MW turbine operating at 10 m/s in a study conducted in 2004, (Kaiser-Wilhelm-Koog, 2004). It is anticipated that this tonal hum would blend into the background noise produced by the wind blowing and rustling vegetation.

12.2.3 AESTHETICS

12.2.3.1 Existing Aesthetics

Agricultural fields, farmsteads, fallow fields, large open vistas and gently rolling topography visually dominate the wind farm site. The landscape can be classified as rural open space. The photos in Figure 9 shows typical landscapes within the Project area. Vegetation in and near the Project area is predominantly pasture with corn, small grains and forage crops, creating a low uniform cover. A mix of deciduous and coniferous trees, planted for windbreaks, typically surround farmsteads. In the swales, there is occasional riparian growth of native willows, cattails, sedges and rushes.

The settlements in the Project area are residences and farm buildings (inhabited and uninhabited) scattered along the rural county roads. These structures are focal points in the dominant open space character of the vicinity. A number of the farm structures date back to the late 19th or early 20th centuries and are representative of that era of South Dakota farm architecture. Typically, the farmsteads and residences are located at lower elevations to avoid winds common to the area.

Xcel Energy currently purchases power from several existing wind farms with a combined capacity of over 400 MW along the Buffalo Ridge in Minnesota, which is somewhat near the Project area. These wind farms are located east and southeast of the Project site.

Viewpoints and photo locations were selected during a field reconnaissance to determine representative viewsheds. The longest viewshed of the existing wind farm is approximately 7 miles. At this distance, the turbines can be distinguished from vertical forms in the landscape, such as overhead transmission lines or trees. The paved highways and two-lane county roads carry varying amounts of traffic, most of which is local. The remote rural character of the area is especially apparent along county roads. These county roads typically would not have expansive views of the proposed wind farm; instead, they would have close views of the site and vicinity. However, in the general area of the site where the roads are at higher elevation, there would be intermittent, expansive views of the area.

FIGURE 9
TYPICAL PROJECT LANDSCAPE

12.2.3.2 Aesthetic Impacts

The placement of turbines would have an effect on the visual quality within the site vicinity. However, discussion of the aesthetic effect of the proposed wind farm is based on subjective human response. The wind farm would have a combination of effects on the visual quality/rural character of the area. From one measure of standards, the proposed project could be perceived as a visual intrusion, characterized as metal structures, 70 to 100 meters high at hub height, standing on formerly undisturbed ridgelines, intruding on the natural aesthetic value of the landscape.

On the other hand, wind farms have their own aesthetic quality, distinguishing them from other non-agricultural land uses. First, the wind farm does not generate much traffic or generate a noticeable increase in day-to-day human activity in the area. Therefore, the project site would retain the rural sense and remote characteristic of the vicinity. Second, although "industrial" in form and purpose, turbines are essentially "farming" the wind for energy. The proposed land use would not involve any ongoing industrial use of non-renewable resources or emissions into the environment. Although the turbines are high-tech in appearance, they are compatible with the rural, agricultural heritage of the area.

Essentially, the installation of the Project would modify the visual quality of the area. The topography in the Project area is generally flat and the vegetation cover is uniformly low, making the ridgelines of the landform in the vicinity highly vulnerable to visual disruptions. Wind turbines already existing near the project have altered the landscape in the area from agricultural to wind farm/agricultural. The proposed project would intensify the visual character imposed by the existing wind turbines.

The cumulative effect of the proposed project would increase both the "industrial" appearance of the wind farms on Buffalo Ridge and the areas from which they would be seen. Since wind generation development is likely to continue on the ridge, this visual impact is probably inevitable. In addition, it has been noted that the presence of turbines within the viewshed of watershed management areas (WMA) or other natural areas would diminish the natural quality of those areas and the experience of the persons utilizing those areas. While it may be true to some extent that the ability to see turbines in the background intrudes upon the purity of that experience, the same could be said of any human habitation or activity in the vicinity, and the presence of turbines may be less intrusive than many such activities. Nonetheless, this may be an impact, which is perceived to be negative.

The following are proposed mitigative measures:

- Turbines would not be located in biologically sensitive areas such as wetlands or relic prairies;
- Turbines would not be illuminated, except as required by FAA regulations;
- Existing roads would be used for construction and maintenance where possible. Road construction would be minimized;
- Access roads created for the wind farm facility would be located on gentle grades to minimize visible cuts and fills;
- Temporarily disturbed areas would be reseeded to blend in with existing vegetation.

To attain maximum efficiency, wind power technology requires as much exposure to the wind as possible. As a result, the turbines are located on the ridge tops of Buffalo Ridge, which makes them highly visible to a wide range of surrounding areas. Mitigation measures that would result in shorter towers or placement of the turbines at alternate locations off the ridgelines would result in less efficiency per unit.

12.2.4 ELECTROMAGNETIC INTERFERENCE

There are a number of underground and overhead telecommunications lines in the Project area. Telecommunications firms located in areas with wind development have sometimes experienced disturbances to their communications infrastructure from electric feeder and communications lines associated with wind farms. The Applicant would work with such telecommunications companies to alleviate any interference problems. The Applicant has completed a study of the potential for WTGs to obstruct microwave telecommunications paths. This study determined that no microwave paths intersect the Project area, so there would be no effects on microwave transmissions.

WTGs can also sometimes block or interfere with broadcast signals, causing video "ghosting" or "shimmering." The Applicant would conduct a baseline field study to precisely measure the current level of television reception in the Project area, and then after the Project is built, would conduct follow-up studies, as needed, to measure any degradation in television reception. The Applicant would resolve such problems on a case-by-case basis. Preliminary study has shown that there are a total of 18 stations within 50 miles of the Project area. Of these, nine are presently licensed and operational. However, only two are full-power broadcast stations received on regular TV receivers. One is located in Brookings, South Dakota approximately 10 miles away, and the other is in Worthington, Minnesota, approximately 47 miles away. The other seven, are low-power translators or transmitters, or are digital stations licensed, or not yet licensed but transmitting on special authority

granted by the Federal Communications Commission. All of the affects to the television broadcast quality would depend on the relative location of the television station antenna, the WTGs and the position of the reception point. The television station from the Brookings area would be most affected in the communities that are east, north, and northeast of the Project area. The television station from the Worthington, Minnesota area would be most affected, if at all, in the communities to the west, northwest, and north of the Project area.

13.0 LOCAL LAND USE CONTROLS (ARSD 20:10:22:19)

The majority of the Project would be constructed on agricultural land regulated by Brookings County, South Dakota. Applications would be made for Conditional Use Permits, a Soil Erosion & Sediment Control Plan, Building Permits and Driveway Application and Construction Permits. One of the primary focuses of the zoning authorizations for the Project would be the required setbacks for WTGs from various structures and land uses (residences, roads, property lines).

Brookings County Zoning requirements for WESs (Section 1212(D)(2)) establishes the following setbacks:

- Residences, businesses and public buildings 1,000 feet
- Public Road ROW 500 feet
- Property Lines (unless an easement is obtained) 500 feet

Project components have been placed and the project would be constructed in general accordance with Brookings County setback requirements.

14.0 WATER QUALITY (ARSD 20:10:22:20)

Potential impacts to water quality are addressed in Section 10.0. The excavation and exposure of soils during the construction of wind turbines and access roads could cause sediment runoff during rain events. These sediments would increase the TSS loading in receiving waters. This is of special concern given that the portions of the upper Big Sioux River downstream from the Project area are impaired due to elevated TSS levels.

However, since the Project would disturb more than 1 acre (it is estimated that approximately 105 acres would be disturbed as a result of the construction of turbines, electric feeder system, access roads and Project collection substation), an NPDES permit would be required. The South Dakota DENR has issued a General Storm Water Permit for Construction Activities; an application for coverage under this permit would be needed for the project. One of the conditions of this permit is

the development of a SWPPP. The SWPPP would mandate BMPs to control erosion and sedimentation. BMPs may include silt fencing, erosion control blankets, temporary storm water sedimentation ponds or other methods of controlling storm water runoff and minimizing sedimentation (SD DENR, 2005).

As a result of implementation of the conditions of the General Storm Water Permit process (SWPPP mandated BMPs) the Project is not expected to have any detrimental impact on water quality.

15.0 AIR QUALITY (ARSD 20:10:22:21)

The Project area is currently in attainment for both National and South Dakota Ambient Air Quality Standards. In fact, the entire State of South Dakota is in attainment for all criteria pollutants (U.S. EPA). The nearest Ambient Air Quality Monitoring Site is located at the Brookings City Hall in Brookings County, South Dakota, which is southwest of the Project (SD DENR, Map of Monitoring Sites).

During construction of the project, fugitive dust emissions would increase due to truck and equipment travel in the area. The additional particulate matter emissions are not expected to exceed the National Ambient Air Quality Standards (NAAQS). The project would produce no air emissions.

16.0 TIME SCHEDULE (ARSD 20:10:22:22)

The Applicant proposes to have the White Wind Farm operational by December, 2007. A permitting and construction schedule for the Project is provided below.

- Submit PUC Permit Application — June 2006
- PUC Permit (and other permits) Received — December 2006
- Road Clearing and Construction — May-Oct. 2007
- WTG Foundation Construction — May-Oct. 2007
- Grading, Trenching of Underground Facilities — July-Oct. 2007
- Overhead Electrical Collection Line Construction — July-Oct. 2007
- WTG Assembly, Communication & SCADA System Installation — June-Nov. 2007
- Collection Substation Construction — May-Aug. 2007
- WTG Testing — Oct.-Dec. 2007

17.0 COMMUNITY IMPACT (ARSD 20:10:22:23)

17.1 EXISTING SOCIOECONOMIC AND COMMUNITY RESOURCES

17.1.1 COMMUNITIES

An area within 1 mile of the Project area is considered the affected socioeconomic environment in this analysis. Additional socioeconomic information on Brookings County is provided to place this area in a larger context.

The 2000 Brookings County Comprehensive Plan shows population growth leveling off and a general trend of migration from rural areas to towns and cities (Brookings County Planning Commission, 2000). Table 8 summarizes some of the demographic characteristics of the area.

The population in this area is generally white and is slightly less diverse, in terms of racial composition, than the populations of Brookings County and South Dakota as a whole. The median age of residents in this area ranges from 26.5 in Richland Township to 50.3 in Lake Hendricks Township. This area is rural in nature, and the percentage of persons employed in agriculture, forestry, fishing, hunting and mining ranges from 11.3 to 50 percent, higher than the percentages for Brookings County, 5.9 percent, and South Dakota, 8.1 percent (U.S. Census Bureau, 2000).

Median family income ranges from $21,250 in Richland Township to $60,313 in Aurora Township. With the exception of Richland Township, the median household income is between 9.3 and 70.2 percent higher than Brookings County and between 9.8 and 70.9 percent higher than South Dakota (U.S. Census Bureau, 2000). Information from the 2000 Census shows unemployment near the Project area between 0 and 2.8 percent, lower than the rate for either Brookings County (3.6 percent) or South Dakota (3.0 percent) (U.S. Census Bureau, 2000). More recent information indicates that the unemployment rate in Brookings County measured 3.4 percent in May 2005, slightly lower than the 3.9 percentage statewide (Labor Market Information Center, 2005).

The two nearest towns to the proposed Project are White (population 530) and Bushnell (population 75). Brookings (population 18,504), the County Seat, is approximately 8 miles southwest of the Project area. There are one or two restaurants in White, and Brookings has services including hotels, restaurants, public schools, a hospital and South Dakota State University (2004/2005 enrollment: 10,561).

TABLE 8
DEMOGRAPHIC CHARACTERISTICS OF FACILITY AREA

Area	Population	Percent White	Median Age	Median HH Income	Median Home Value	Social Security Income (Percent HH)	Percent Employed in Ag or extractive industries
Afton Township	224	99.1	38.3	$46,875	$95,500	34	17.1
Alton Township	276	98.6	36.4	$42,231	$55,000	15	14.1
Aurora Township	233	96.6	40.2	$60,313	$81,300	20	11.3
Lake Hendricks Township	172	97.1	53.2	$38,750	$108,300	29	17.2
Richland Township	195	98.5	26.5	$21,250	$61,700	33	50
Sherman Township	175	99.4	35.3	$38,750	$100,000	34	17.6
Brookings County	28,220	96.4	26.6	$35,438	$88,500	21	5.9
South Dakota	754,844	88.7	36	$35,282	$79,600	28	8.1

Source: US Census, 2000

17.1.2 AGRICULTURE

Brookings County's 962 farms (418,115 acres) produced a total market value of agricultural products of over $97.5 million in the year 2002, including $42.8 million in crops and $54.8 million in livestock, poultry and related products (USDA, 2002). Approximately 66 percent of the land within the Project area is prime farmland.

17.1.3 TRANSPORTATION

The Project area is located south and east of State Highway 30, a paved, two-lane highway. This highway connects to Interstate 29 approximately 6 miles west of the City of White, and to Minnesota State Highway 19 approximately 6 miles east of the Project. Traffic volume data is not available for area highways, but most vehicular traffic is limited to local commuters and farm equipment.

Numerous gravel and unimproved dirt roads provide access to various portions of the Project area. Table 9 lists roads within the Project area.

TABLE 9
AREA ROADS

478th Avenue	Paved Asphalt
477th Ave., 479th Ave., 480th Ave., 481st Ave., 482nd Ave., 483rd Ave., 484th Ave., 485th Ave.	Gravel with Class-5 Surface
State Highway 30	Paved Asphalt
202nd St., 203rd St., 204th St., 205th St., 206th St., 207th St., 208th St., 209th St. 210th St.	Gravel with Class-5 Surface

17.1.3.1 Aviation

There are no regional or municipal airports in the vicinity of the Project. The closest airport is in Brookings, approximately 10 miles southwest of the Project. This airport provides regular commercial service, as well as private and charter plane service. Other (small) airfields accommodating small single engine planes are located near Clear Lake, Flandreau and Arlington, South Dakota. These airports are located more than 20 miles from the Project.

17.1.4 CULTURAL RESOURCES

Because the interconnection with Western's White Substation would require a federal action, the project would comply with federal laws relative to identification, management and protection of cultural resources. Western would review the project under the auspices of these requirements, including those put forth in Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA) and its implementing regulations (36 CFR 800) and in compliance with the Native American Graves Protection and Repatriation Act (NAGPRA).

Based on stipulations outlined in a pending Programmatic Agreement (PA), the Applicant sponsored a Class I cultural resources inventory. The inventory included a review of existing cultural resources documentation on file in state repositories, a preliminary architectural history windshield survey near the Project area and a review of 19th century Public Land Survey maps. The resulting report, Class I Cultural Resources Inventory for the White Wind Farm Project, Brookings County, South Dakota (Palmer, 2005) is summarized here and is attached as Appendix C.

The Project area contains nine previously inventoried archaeological resources; two have been determined not eligible and seven have not been evaluated. In addition to these nine resources, six additional previously inventoried archaeological resources are located outside of the Project area but within 1 mile; one has been determined eligible for listing on the National Register of Historic Places, one has been determined not eligible and four have not been evaluated (Palmer, 2005).

In April 2005, the Applicant performed a windshield survey along public roads in the Project area. The Project area contains a large number of structures that are over 45 years of age, either located individually on the landscape or associated with other contemporary or modern structures as part of a complex. Standing structures in the Project area (outside of the city of White) are primarily active and abandoned agricultural complexes (residences and outbuildings including corn cribs, barns and sheds). The complexes have windrows and other landscaping elements typical of late 19th and 20th century farmsteads. Other structures include bridges over drainages and light industrial buildings such as machine shops. The windshield survey of City of White identified residential, commercial and civic structures and light industrial and agricultural buildings constructed in the late 19th century and throughout the 20th century (Palmer, 2005).

The Project area contains two previously inventoried standing structures, neither of which appears to have been evaluated for listing on the National Register of Historic Places (NRHP). An additional 196 previously inventoried standing structures have been identified outside of the Project area, but within 1 mile; 171 of these structures are located in the City of White; most of these structures are private residences and commercial buildings constructed between 1886 and 1965. None of the structures appear to have been evaluated for listing on the NRHP (Palmer, 2005).

17.2 SOCIOECONOMIC AND COMMUNITY IMPACTS

17.2.1 COMMUNITY IMPACTS

Any impacts to social and economic resources should be of a short-term nature. Revenue would increase for some local businesses, such as hotels, restaurants, gas stations and grocery stores, due to workers associated with construction of the project. Other local businesses such as ready-mix concrete and gravel suppliers, 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 project. Impacts to social services would be unlikely because of the short-term nature of the construction project.

Construction crews would be nearly 100 personnel at peak for the proposed Project. Public Requests for Proposals would be issued to contractors near the Project. The Applicant would encourage and prefer to hire local firms. However, based on historic data, approximately 75 percent of the crew would involve out-of-area personnel; approximately 25 percent would be recruited locally. The estimated monthly payroll would be approximately $300,000 during the peak construction period. Construction workers would likely reside in nearby houses or motels. Table 10 presents the estimated construction payroll for the project in 2007. All construction work is anticipated to be complete in 2007.

TABLE 10
ESTIMATED CONSTRUCTION EMPLOYMENT EXPENDITURES BY JOB CLASSIFICATION

Job Classification	Estimated 2007 Expenditure
Construction Supervisor	$135,000
Earthwork	$195,000
General Construction	$230,000
Linemen	$105,000
Structural Labor (WTG Erection)	$925,000
Electrical Technician (WTG Testing)	$95,000
Electrical Technician (Substation)	$95,000

Construction activities for this project would be short-term. Therefore, no long-term impact to the socioeconomics of the area is expected; any short-term effects likely would be beneficial to local businesses.

Fire services for the Project area are provided by Brookings County volunteer fire departments located in White, Brookings, Volga, Estelline and Aurora. Turbine access roads would improve emergency access to the Project area. Appropriate precautions, including lightening protection and grounding would be used to minimize the creation of additional fire risk in the Project area. Upon completion of the project, White Wind Farm, LLC, would provide information and on-site training to the local fire departments.

The Project would have no lasting impact on the industrial sector, housing, labor market, health facilities, sewage and water systems, existing energy facilities, solid waste facilities, schools, law enforcement, other community and government facilities nor any recreation facilities. The Project would have no impact on population, income, occupation distribution nor the integration and cohesion of communities.

There would be some long-term beneficial impacts from the White Wind Farm. These benefits include an increase to the county's tax base resulting from the incremental increase in revenues from property taxes, which are based on the value of the facilities. It is estimated that the Project would contribute approximately $1 million to $1.4 million per year to the Brooking's County tax base. The availability of reliable renewable power in the area would have a positive effect on local businesses and the quality of service provided to the general public. This increase in locally generated power would come with no, or insignificant impacts, to the local environment, as compared to fossil-based power sources.

There would be three types of petroleum fluids used in the operation of the wind turbines. These fluids are necessary for the operation of each turbine and include gear box oil – synthetic or mineral depending on application, hydraulic fluid and gear grease. All fluids would be contained within the wind turbine structure. Except for oil changes (turbines are designed with a secondary containment for spills within the nacelle), there should be no leakage and no need to dispose of the fluids (except in the rare case of contamination) over the life of the wind turbine.

Because there are no proposed impacts to hazardous waste sites, no mitigation measures are proposed. If any wastes, fluids or pollutants are generated during any phase of the operation of the Project, they would be handled, processed, treated, stored and disposed of in accordance with local, state, and Federal rules and regulations.

There is limited literature available on the effect of wind farms to property values. A 2003 study that reviewed sales data for properties in the vicinity of wind farms (Sterzinger et al, 2003) showed a small positive correlation in the value of properties sold within 5 miles of wind developments when compared to properties sold in comparable communities.

17.2.2 AGRICULTURAL IMPACTS

Existing agricultural land would be taken out of crop and forage production by the proposed Project, primarily areas around WTG foundations, access roads and electric collection and interconnection facilities. It is estimated that approximately 83 acres of agricultural land would be impacted, which constitutes less than 1 percent of the total cultivated cropland in the Project area, and approximately 0.02 percent of the total 418,115 acres of cropland in Brookings County. Approximately 66 percent of the land within the Project area is considered prime farmland. An additional 7 percent is considered prime farmland if drained. The magnitude of the loss of farmland is small relative to the total acres of farmable acreage in the county.

17.2.3 TRANSPORTATION IMPACTS

The Project area consists of state and county highways and local access roads. During construction, it is anticipated that several types of light, medium and heavy-duty construction vehicles would travel to and from the site, as well as private vehicles used by the construction personnel. That volume would occur during the peak construction time when the majority of the foundation and tower assembly is taking place. At the completion of each construction phase, this equipment would be removed from the site or reduced in number.

The Project would not result in any permanent impacts to the area's transportation resources. There may be some temporary impacts to local roads during the construction phase of the Project. The Applicants would work with Brookings County to minimize any impacts to area transportation.

17.2.3.1 Air Traffic

The Applicant would light the turbines to comply with FAA requirements to minimize any potential impacts with the proposed turbines. Determination of No Hazard to Air Navigations were issued by the FAA for preliminary locations within the project area. (Airport comment in 23.12)

17.3 CULTURAL RESOURCE IMPACTS

A review of the recorded archaeological site information and the information in previous survey reports indicates that the Project area has a relatively high potential for prehistoric archaeological resources, particularly on elevated landforms that have escaped cultivation. The previous archaeological surveys, primarily surveys of linear power line corridors and associated features, identified nine prehistoric archaeological resources that illustrate the variety of resources that exist in the Project area and vicinity. Six of these archaeological resources are within the Project area; the remaining three are within 1 mile. Historic-period archaeological resources are also present, particularly those that may relate to historic American Indian occupations, railroad operations and agricultural activities after the 1870s.

The existing architectural documentation and the results of a windshield survey show that standing structures dating from the 1880s exist in the Project area and vicinity. These properties include residential, agricultural, commercial and light industrial structures.

Western has developed guidelines for conducting Section 106 reviews. As part of the Section 106 review process, Western would conduct formal consultation with the South Dakota State Historic Preservation Office (SHPO) and with Native American Tribes. Western would also determine the Project's Area of Potential Effects (APE) and that area would be reviewed to identify cultural resources and, if necessary, evaluate and identify measures to mitigate project effects. The Section 106 process must be completed before Western can approve the Applicant's interconnection request.

A Class III cultural resources survey is in the process of being prepared, as proposed, for construction of the wind turbines, associated access roads and staging areas and other elements proposed for development. The PA, prepared by Western and reviewed by consulting parties, has established the APE. For this project, the APE was defined as a 450-foot square area centered on each proposed turbine location, and a 100-foot corridor centered on proposed access roads and collector lines. The selection of these areas allows flexibility in the final placement of WTGs and associated infrastructure

should significant archaeological sites or standing structures be identified that could be physically impacted by construction of the project.

Survey methodologies to inventory cultural resources within the APE, document previous disturbance in areas proposed for ground disturbance and provide a preliminary recommendation for NRHP eligibility for each identified resource were approved by Western. Upon completion of the survey, this information would be communicated to Western as a Class III inventory report. With concurrence from Western, potentially affected properties would be evaluated for NRHP eligibility and, if determined Eligible, resource specific treatment plans would be developed in coordination with Western and the PA signatories. Treatments may include avoidance of eligible archeological sites, impact minimization or mitigation.

The Project would have no impact on landmarks, nor other cultural resources of historic, religious, scenic or natural significance.

17.4 RELIABILITY AND SAFETY OF WIND TURBINES

17.4.1 RELIABILITY

Gamesa (the likely manufacturer of the WTGs) has a world wide warranted reliability of 97 percent, with estimated actual reliability of 98 percent, which may be the highest of all turbine manufacturers. Reliability is defined as the ability of the turbine to generate electricity when sufficient wind is available. Gamesa has over 6,527 machines installed worldwide representing 5,383 MW. The G8X has 599 units installed worldwide with 39 units installed and operating in the US. It is estimated that an additional 227 G8X units would be installed in the US in 2006.

17.4.2 SAFETY

The Project site is located in an area that has a low population density. Construction and operation of the Project would have minimal impacts on the security and safety of the local populace. The following safety measures would be taken to reduce the chance of physical and property damage, as well as personal injury, at the site:

- The towers would be placed at distances away from roadways and homesteads considered safe per the Brookings County Zoning requirements;
- Security measures would be implemented during the construction and operation of the Project including temporary (safety) and permanent fencing, warning signs and locks on equipment and wind power facilities;

- Turbines would sit on solid steel enclosed tubular towers in which all electrical equipment would be located,. Access to the tower is only through a solid steel door that would be locked and accessed only by authorized personnel.
- Exterior of towers are designed to be unclimbable.
- Turbines would conform to applicable industry standards, including those of the American National Standards Institute ("ANSI"). In addition, certificates of design compliance that equipment manufacturers have obtained from Underwriters Laboratories ("UL"), Det Norske Veritas ("DNV"), Germanischer Lloyd Wind Energie ("GL"), or an equivalent third party would be obtained by the applicant.
- a Professional Engineer would certify that the foundation and tower design of the turbines is within accepted professional standards, given local soil and climate conditions.

18.0 EMPLOYMENT ESTIMATES (ARSD 20:10:22:24)

See Section 17.2.1.

19.0 FUTURE ADDITIONS AND MODIFICATIONS (ARSD 20:10:22:25)

There are neither future additions nor modifications planned for the project.

20.0 ALTERNATIVE ENERGY SOURCES (ARSD 20:10:22:30)

Navitas Energy's primary and only focus is the business of developing and operating wind energy facilities. Therefore, no other alternate energy sources were considered for development. As Section 6.0 (Alternative Sites) describes, alternative sites for the wind energy facility were considered. Regional utilities rely on many other forms of generation sources (coal, nuclear, hydroelectric, natural gas, oil), but are now also focusing on renewable resources, like wind energy. Some states, including Minnesota, have renewable portfolio standards, with some mandated targets for renewable energy. The Project proposed by Navitas in this application is in response to the general increase in demand for renewable energy production.

21.0 DECOMMISSIONING OF WIND ENERGY FACILITIES

Navitas Energy has entered into up to 20 year lease agreements for placement of the WTGs and associated infrastructure with private landowners within the Project area. The Applicant would have the option to renew the leases at the end of the 20-year agreement. The decision to renew the leases, versus decommissioning of the facility, would be made at that time, based on market conditions.

Within 120 days of completion of Project construction, the Applicant would submit a Decommissioning Plan to the Brookings County Zoning Department. The Decommissioning Plan would outline the manner in which decommissioning activities would be conducted. Upon termination of operations, the Applicant would have the obligation to dismantle and remove all Project components. Unless written approval is given by the affected landowner, all Project components would be removed to a depth of 48 inches and the soil would be restored to a condition reasonably similar to the condition of the surrounding soil.

22.0 TRANSMISSION FACILITY LAYOUT AND CONSTRUCTION, INFORMATION (ARSD 20:10:22:34 AND 35) – INTERCONNECTION FACILITIES

The White Wind Farm generator step-up substation consists of gas insulated switchgear (GIS) with seven feeder breakers, a main breaker, and a capacitor bank for power factor correction. This switchgear feeds a power transformer (34.5 kV to 345 kV) which is connected to the transmission system via a high side circuit breaker and disconnect switch. The arrangement also includes instrument transformers to monitor voltage and current for relaying and metering functions (Figure 6).

The connection between the White Wind Farm Substation and the existing Western White Substation would be a single span 3-phase circuit between two structures located in the respective substation yards. The distance between the structures is 400 feet. The height is 40 feet and the spacing width would be approximately 32 feet. The conductor would be 1113 kcmil ACSR 45/7 "Bluejay" in a horizontal configuration.

There are no underground transmission facilities related to the project. No clearing would be required for the proposed interconnection between the substations.

In the existing 345 kV White Substation owned and operated by WAPA, the line would connect from the north into a breaker and a half bus arrangement. The substation currently connects to transmission lines going to Watertown and Split Rock Substations, and also to a step down 13.8 kV distribution substation in the same yard.

23.0 ADDITIONAL INFORMATION IN APPLICATION (ARSD 20:10:22:36)

23.1 PERMITS AND APPROVALS

The Project must comply with Federal, state and local laws requiring permits or approvals. Based on consultations with representatives of state, local and other Federal agencies, the project would require the following permits and approvals from the following agencies:

- Western National Environmental Policy Act (NEPA) compliance
- U.S. Army Corps of Engineers (USACE) Section 404 compliance
- U.S. Fish and Wildlife Service (USFWS) Section 7 consultation
- Section 106 review with Native American Tribes and South Dakota State Historical Society
- Federal Aviation Administration (FAA)
- South Dakota Public Utilities Commission (PUC)
- South Dakota Department of Environment & Natural Resources (401 Water Quality Certification and National Pollution Discharge Elimination System (NPDES) Storm Water Permit for Construction Activities)
- South Dakota Department of Transportation (Highway Access Permit and Utility Permit)
- Brookings County (Conditional Use Permit, Soil Erosion & Sediment Control Plan, Building Permit, Driveway Application and Construction Permit)

23.2 AGENCY CONSULTATION AND PUBLIC SCOPING PROCESS

A Notice of Intent to prepare an Environmental Impact Statement (EIS) was published in the Federal Register on February 18, 2005. Western provided notice of scoping meetings to tribal, local and state entities, as well as the public. Notice was also published in the Tri-City Star newspaper on February 17 and 24, 2005. In addition, as part of lease negotiations, the Applicant has been communicating and meeting with area landowners throughout development of the proposed Project. This interaction has provided an opportunity for public input. The Applicant has also consulted with various local, state and Federal agencies to identify agency concerns regarding the proposed Project (Appendix D).

Western mailed scoping meeting notices directly to 198 parties, including landowners, local, state and Federal agencies and elected officials. On February 15, 2005, Western mailed letters to the following

Indian tribes: Flandreau Santee Sioux, Lower Sioux Indian Community of Minnesota, Prairie Island Indian Community of Minnesota, Santee Sioux Nation, Sisseton-Wahpeton Oyate, Spirit Lake Tribe, Upper Sioux Indian Community of Minnesota and Yankton Sioux Tribe. The letter notified tribes of the Project and invited the tribes to participate in the required NEPA review and the National Historic Preservation consultation process.

A scoping meeting for the Project was held at the Midwest Center for Wind Energy, near Hendricks, Minnesota, on March 1, 2005. This meeting was announced in the advertisements published on February 17 and 24, 2005 in the Tri-City Star and mailings to a distribution list that included local government officials, agencies, tribes and individuals. Forty people attended the meeting, representing landowners, local units of government, media and interested members of the public.

The same handouts used to publicize the scoping period were available to all scoping meeting attendees. These handouts included a fact sheet and a comment response/distribution list request.

Both Western and the Applicant used posters to present information to the scoping meeting attendees. Western's posters presented the NEPA process, while the Applicant's posters provided information on the Project.

23.3 SCOPING COMMENTS

Comments received at the scoping meetings were recorded on a flip chart and posted on the walls during the meeting. Attendees were provided with comment sheets at the meeting. They were asked to write down any comments and either return the sheets at the meeting or mail them in by the close of the scoping period. Western received 17 written comments. Oral and written comments are summarized below and grouped by subject.

23.4 ALTERNATIVES

Several comments addressed alternate locations for the Project. Several comments inquired as to whether the Project could be expanded to include their land. Other comments expressed general support of wind power and one comment expressed opposition to wind power. Project alternatives are addressed in Section 6.0.

23.5 AIR QUALITY

One comment requested information on the Project's impact to air quality. Project impacts on air quality are addressed in Section 15.0.

23.6 WATER RESOURCES

One comment requested information on whether the Project would impact an intermittent stream within the Project area. Project impacts on water resources are addressed in Section 11.0.

23.7 BIOLOGICAL RESOURCES

Western received several comments concerning the potential for impacts to avian species and bats. Comments requested information about avian mortality resulting from collisions, identification of avian flyways and wetland stopover sites in the Project area and loss of habitat or habitat avoidance behaviors by wildlife. Impacts to federally listed threatened or endangered species were also identified as an issue of concern. Project impacts on biological resources are addressed in Section 10.0.

23.8 VISUAL RESOURCES AND AESTHETICS

Several comments requested additional information on the visual impacts from the Project. Project impacts on visual resources and aesthetics are discussed in Section 12.2.3.

23.9 NOISE

Several comments indicated concern with potential noise from the Project. Project impacts on noise are discussed in Section 12.2.2.

23.10 TRANSPORTATION

Western received one comment citing concern about impacts to existing roads during construction. Project impacts on transportation resources are discussed in Section 17.2.3.

23.11 PROPERTY VALUES

Several comments requested information on the Project's effect on property values and the ability to sell land near the Project. Project impacts on property values are discussed in Section 17.2.1.

23.12 LAND USE AND GRASSLANDS

Western received one comment that a new airstrip may be built in the Project area. Another comment requested information on whether tall grass prairie easements with the USFWS might interfere with development of wind power. Project impacts on these uses are discussed in Sections 17.2.1, 17.2.3 and 11.2.

23.13 SOCIOECONOMICS

Western received three comments expressing support for development of wind power in South Dakota. Other comments requested that their land holdings be considered for WTG placement. Project impacts on socioeconomics are discussed in Section 17.2.

23.14 IMPACT ON EXISTING UTILITIES AND PLANNED WIND FARMS

Western received comments requesting that the Project not interfere with the development of other wind generation projects in the area. Besides the Applicant, other wind developers own wind rights to property within the Project area. There are also electric transmission facilities within the Project area. A local telecommunications company requested that the Applicant coordinate with them when locating electrical feeder and communication lines to avoid interference with existing telecommunications infrastructure. An oil pipeline from Canada to Illinois is in the planning stages and one comment requested information on whether this pipeline may impact the Project. Project impacts on existing utilities and planned wind farms are discussed in Section 17.3 and Section 7.0.

23.15 CUMULATIVE EFFECTS

The USFWS has raised concerns about the possibility of cumulative impacts from the number of wind projects and transmission projects announced in the general area surrounding the White Substation. Project cumulative impacts are being addressed in the Federal NEPA EIS process.

23.15.1 APPLICANT'S BURDEN OF PROOF – 49-41B-22

As described in the Executive Summary, in this Application the Applicant has addressed all matters set forth in SDCL Chapter 49-41B and in ARSD chapter 20:10:22 (entitled Energy Facility Siting Rules), related to wind energy facilities.

Pursuant to SDCL 49-41B-22, the information presented in this application establishes that:

1. The proposed wind energy facilities comply with all applicable laws and rules;
2. The facilities would not pose a threat of serious injury to the environment or to the social and economic condition of inhabitants in, or near the Project area;

3. The facilities would not substantially impair the health, safety, or welfare of the inhabitants; and
4. The facilities would not unduly interfere with the orderly development of the region, having given consideration to the views of the governing bodies of the local affected units of government.

24.0 TESTIMONY AND EXHIBITS (ARSD 20:10:22:39)

24.1 LIST OF PREPARERS

The following groups contributed to this report:

Navitas Energy, Inc.
HDR Engineering, Inc.
Western Ecosystems Technology
Two Pines Resource Group
Western Area Power Administration
Arcadis US

24.2 APPLICANTS' VERIFICATION

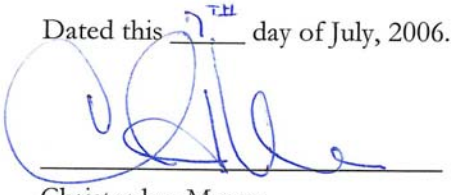
VERIFIED APPLICANTS' SIGNATURE

STATE OF SOUTH DAKOTA)
:SS
COUNTY OF BROOKINGS)

Christopher Moore, being duly sworn, deposes and says that he is Managing Director of Navitas Energy, Inc. and is the authorized agent of White Wind Farm LLC and is also authorized to sign this application on behalf of the Applicant.

He states that he does not have personal knowledge of all of the facts recited in the foregoing application, but the information in the application has been gathered by and from employees and contractors of the owner of the White Wind Farm; and that the information in the application is verified by him as being true and correct on behalf of the Applicant.

Dated this 7th day of July, 2006.



Christopher Moore

24.3 DEFINITIONS AND ABBREVIATIONS

Applicant	White Wind Farm, LLC
APE	Area of Potential Effects
AWEA	American Wind Energy Association
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CRP	Conservation Reserve Program
dB	Decibels
dBA	A-weighted decibel
DEIS	Draft Environmental Impact Statement
DENR	South Dakota Department of Environment and Natural Resources
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FSA	Farm Service Administration
GFP	South Dakota Department of Game, Fish and Parks
Hz	Hertz
Leq	equivalent noise level
m/s	meters/second
MISO	Midwest Independent System Operator
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NRI	National Rivers Inventory
NWI	National Wetlands Inventory
PA	Programmatic Agreement
PII	Potential Impact Analysis

PPA	power purchase agreement
PUC	South Dakota Public Utilities Commission
ROW	right of way
rpm	revolutions per minute
SHPO	State Historic Preservation Office
SWPPP	Storm Water Pollution Prevention Plan
TSS	total suspended solids
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WES	Wind Energy System
WEST	Western Ecosystems Technology, Inc.
Western	Western Area Power Administration
WMA	Watershed Management Area
WTG	wind turbine generator

25.0 REFERENCES

American Wind Energy Association. 2005. *South Dakota Wind Energy Development.* http://www.awea.org/projects/southdakota.html. Retrieved June 15, 2005.

Antoniuk, T. 2002. "Cumulative Effects Assessment and Linear Corridors: The Representative Areas Approach," in J.W. Goodrich-Mahoney, D. F. Mutrie and C. A. Guild (eds.). *Environmental Concerns in Rights of Way Management: Seventh International Symposium.* Oxford: Elsevier Science Ltd., 209-218.

Avian Power Line Interaction Committee. 1996. *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996.* Edison Electric Institute and the Raptor Research Foundation. Washington, DC.

Bryce, Sandra. James M. Omernik, David E. Pater, Michael Ulmer, Jerome Schaar, Jerry Freeouf, Rex Johnson, Pat Kuck, and Sandra H. Azevedo. 1998. *Ecoregions of North Dakota and South Dakota. Jamestown, ND: Northern Prairie Wildlife Research Center.* http://www.npwrc.usgs.gov/resource/habitat/ndsdeco/ndsdeco.htm (Version 30NOV1998). Retrieved 6/20/2005.

Brookings County. Department of Planning and Zoning. *Future Land Use Map Brookings County*

Brookings County Planning Commission. 2000. *Brookings County Comprehensive Plan.* http://www.brookingscountysd.gov/zoning/zoninghtml Retrieved April 19, 2004.

Brookings County Planning Commission. 1997. *1997 Revised Zoning Ordinance of Brookings County, South Dakota.*

Brookings County Planning Commission. 2005. *Section 1212 of Zoning Ordinance of Brookings County, South Dakota: Wind Energy System Requirements.*

CapX 2020. 2005. Realizing the CapX 2020 Vision: Information Briefing – Moving to Implementation
Presentation to Minnesota Public Utilities Commission. 18 July 2005. http://www.capx2020.com/Images/MPUC_Briefing_07.18.05.pdf. Accessed August 12, 2005.

Council on Environmental Quality (CEQ). 1997. *Considering Cumulative Effects Under the National Environmental Policy Act*. Washington: Council of Environmental Quality, 64 pp.

Derby, Clayton; Poulton, Victoria. 2005. *Phase One Screening Report and USFWS PII Score White Wind Farm, White, South Dakota.* Western EcoSystems Technologies.

Duebner, David. 2005. *Midwest ISO Iowa -Southern Minnesota Exploratory Study*. Presentation to NWCC Midwestern Transmission Workshop St. Paul, MN, June 22, 2005. http://www.nationalwind.org/events/transmission/midwest/2005/presentations/duebner.pdf. Accessed August 12, 2005.

Farm Service Agency, Brookings County Field Office. Telephone conversation. June 20, 2005

Federal Emergency Management Agency. 1987. Flood Insurance Rate Map of Brookings County, South Dakota.

Grivna, Walt. 2005. *MISO Northwest Exploratory Study*. Presentation to Midwestern Transmission Workshop, June 22, 2005. http://www.nationalwind.org/events/transmission/midwest/2005/presentations/grivna-nw.pdf. Accessed August 12, 2005.

Hammond, R. H. 1993. "Recorded Earthquakes in South Dakota, 1872-1992". South Dakota Geological Survey.

Kaiser-Wilhelm-Koog. 2004. *GmbH, Report of Acoustical Emissions of a Wind Turbine Generator System of the Type G80 2 MW (standard mode) near Carrasquillo*, March 2004

Labor Market Information Center. 2005. *Labor Force Statistics Website, http://www.state.sd.us/applications/ld54lmicinfo/labor/LFLISTPUBM.ASP. Retrieved July 15, 2005.*

Lee, K. Y., et. al. 1957. *Geology of the White Quadrangle, South Dakota.* South Dakota Geological Survey.

National Park Service. 2004. Rivers, Trails and Conservation Program – South Dakota Segments. http://www.nps.gov/ncrc/programs/rtca/nri/states/sd.html. Retrieved on June 9, 2005.

National Renewable Energy Laboratory. *Wind Powering America: South Dakota Wind Resource Map.* http://www.eere.energy.gov/windandhydro/windpoweringamerica/images/windmaps/sd_50m_800 .jpg. Retrieved June 15, 2005.

Palmer, Erika; Madson, Michael. 2005. *Class I Cultural Resources Inventory for the White Wind Farm Project, Brookings County, South Dakota*, HDR Engineering, Inc.

Schultz, Layne D. 2004. *First Occurrence of Aquifer Materials in Brookings County, South Dakota.* South Dakota Geological Survey Aquifer Materials Map 19.

South Dakota Department of Game, Fish and Parks. 2004. South Dakota Public Lands Information Website. http://www.sdgfp.info/Wildlife/PublicLands/PubLand.htm. Retrieved June 10 and 13, 2005.

South Dakota Department of Game, Fish and Parks. 2004. South Dakota Public Lands Information Website. http://www.sdgfp.info/.htm. Walk-In Area Atlas.

South Dakota Department of Game, Fish and Parks. 2004. South Dakota Public Lands Information Website. http://www.sdgfp.info/.htm. Waterfowl Hunting and Game Production Areas/Waterfowl Production Areas.

South Dakota Game, Fish and Parks Department. 2005. *Rare, Threatened or Endangered Animals Tracked by the South Dakota Natural Heritage Program.* http://www.sdgfp.info/Wildlife/Diversity/RareAnimal.htm. Retrieved 6/20/2005.

South Dakota Department of Environment and Natural Resources. 2004. *The 2004 South Dakota Integrated Report for Surface Water Quality Assessment.* http://www.state.sd.us/denr/Documents/04IRFinal.pdf. Retrieved June 20, 2005.

South Dakota DENR. 2005. Storm Water Permit for Construction Activities. http://www.state.sd.us/denr/DES/Surfacewater/stormcon.htm Retrieved on June 9, 2005.

S.D. DENR. *Map of Monitoring Sites.* http://www.state.sd.us/denr/DES/AirQuality/Monitoring/state-mo.htm#MapofMonitoringSites. Retrieved on June 15, 2005.

South Dakota Department of Environment and Natural Resources South Dakota Natural Heritage and Nongame Wildlife Program. 2005. *Threatened Natural Communities and Rare Species List.* Pierre, SD:

State of South Dakota. *South Dakota Codified Laws Chapter 38-22. State and Local Noxious Weeds.* http://www.state.sd.us/dow/das/noxious.htm. Retrieved 6/20/2005.

State of South Dakota. *South Dakota Codified Laws Chapter 38-22. State and Local Noxious Weeds.* http://www.state.sd.us/dow/das/noxious.htm. Retrieved 5/20/2005.

Sterzinger, George; Beck, Fredric; Kostiuk, Damian. 2003. *The Effect of Wind Development on Local Property Values*. Renewable Energy Policy Project. http://www.crest.org/articles/static/1/binaries/wind_online_final.pdf

Tomhave, Dennis W. and Schultz, Layne D. 2004. *Bedrock Geologic Map Showing Configuration of the Bedrock Surface in South Dakota East of the Missouri River*. South Dakota Geological Survey General Map 9.

U.S. Census Bureau. 2000. State and County Quick Facts, Afton Township, Brookings County, South Dakota. http://quickfacts.census.gov/. Retrieved April 19, 2005.

U.S. Census Bureau. 2000. *State and County Quick Facts, Alton Township, Brookings County, South Dakota.* http://quickfacts.census.gov/. Retrieved April 19, 2005.

U.S. Census Bureau. 2000. *State and County Quick Facts, Aurora Township, Brookings County, South Dakota.* http://quickfacts.census.gov/. Retrieved April 19, 2005.

U.S. Census Bureau. 2000. *State and County Quick Facts*, *Brookings County, South Dakota.* http://quickfacts.census.gov/. Retrieved April 19, 2005.

U.S. Census Bureau. 2000. *State and County Quick Facts, Lake Hendricks Township, Brookings County, South Dakota.* http://quickfacts.census.gov/. Retrieved April 19, 2005.

U.S. Census Bureau. 2000. *State and County Quick Facts, Richland Township, Brookings County, South Dakota.* http://quickfacts.census.gov/. Retrieved April 19, 2005.

U.S. Census Bureau. 2000. *State and County Quick Facts, Sherman Township, Brookings County, South Dakota.* http://quickfacts.census.gov/. Retrieved April 19, 2005.

U.S. Census Bureau. 2000. State and County Quick Facts, State of South Dakota. http://quickfacts.census.gov/. Retrieved April 19, 2005.

U.S. Department of Agriculture. 2002. *Census of Agriculture, State and County Reports.* http://www.nass.usda.gov/census/. Retrieved April 19, 2005.

U.S. Department of Agriculture Soil Conservation Service. 1959. *Soil Survey of Brookings County, South Dakota.*

U.S. Department of Agriculture. 2003 NRCS SSURGO Soils Data, Brookings County.

U.S. Department of Agriculture. NRCS STATSGO Statewide Soils Data, South Dakota.

U.S. Environmental Protection Agency. Green Book: Nonattainment Area Map. http://www.epa.gov/oar/oaqps/greenbk/mapnpoll.html . Retrieved June 15, 2005.

United States Federal Government. 2005. "Title 7, Chapter III, Part 360 – Noxious Weed Regulations." *Code of Federal Regulations.* http://www.aphis.usda.gov/ppq/weeds/noxiousweedlist.txt. Retrieved 6/20/2005.

United States Federal Government. 2005. "Title 7, Chapter VI F, Part 657 Prime and Unique Farmlands." *Code of Federal Regulations.* *http://www.washingtonwatchdog.org/documents/cfr/title7/part657.html. Retrieved July 19, 2005.*

United States Federal Government. 2005. "Title 40, Chapter V F, Part 1508. Council on Environmental Quality: Terminology and Index. " Code *of Federal Regulations.* http://www.washingtonwatchdog.org/documents/cfr/title40/part1508.html. *Retrieved July 19, 2005.*

U. S. Fish and Wildlife Service. 2005. *Map of FWS Easements in White Wind Farm Project Area.* Brookings Field Office

U.S. Fish and Wildlife Service. 2005. *National Wetlands Inventory.* St. Petersburg, FL.

Weber, Ed. 2005. *Dakotas Wind Transmission Study*: Presentation to Midwestern Transmission Workshop, June 22, 2005. http://www.nationalwind.org/events/transmission/midwest/2005/presentations/weber.pdf. Accessed August 12, 2005.

APPENDIX A
PHASE I SCREENING, FWS PII SCORE

Phase One Screening Report and USFWS PII Score

White Wind Farm

White, South Dakota

July 15, 2005

Prepared for:

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518

and

Navitas Energy
3001 Broadway St., NE
Suite 695
Minneapolis, MN 54413

Prepared by:

Clayton Derby and Victoria Poulton
Western EcoSystems Technology, Inc.
2003 Central Avenue
Cheyenne, Wyoming 82001

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I. INTRODUCTION

I.A. Purpose

When exploring prospective wind farm sites, knowledge of wildlife and other biological resource issues helps the wind industry and agencies identify and avoid potential ecological problems early in the development process. Additionally, this information is useful in addressing natural resource concerns raised by state and federal natural resource agencies as well as other project stakeholders (e.g., local residents, private organizations). Western EcoSystems Technology, Inc. (WEST) was contracted to conduct biological investigations of the White Wind Farm site proposed for construction by Navitas Energy (Navitas) in Brookings County, South Dakota (Figure 1). The purpose of this report is to investigate general biological issues associated with wind farm development at the proposed site so that major issues can be identified. This investigation generally follows the site evaluation process described in the document "Studying wind energy/bird interactions: a guidance document" (Anderson et al. 1999) and the U.S. Fish and Wildlife Service's "Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines" (USFWS 2003). To evaluate the site at this level, the investigation relies heavily on existing local, regional, and national research efforts, input from agencies, and other literature, and does not include a large pre-construction baseline study effort. A reconnaissance-level site visit was conducted to evaluate major land features (e.g., topography, ridge aspect, water bodies, etc.) and to map general vegetation types in the project area. This report presents the observations made during the site visit, describes agency consultations, discusses the results of a literature review in order to assess the potential impacts of the proposed wind farms on state and/or federally protected or sensitive species of concern, and presents the Potential Impact Index (PII) score associated with the USFWS Interim Guidelines.

This report focuses on the proposed wind farm site and the following potential areas of concern:

- Raptors
- Federal Species of Concern
- State Wildlife Issues
- Unique Habitats
- Wetlands
- Bats
- Avian Migratory Pathways

I.B. Project Description

The proposed White Wind Farm project area is located between 5.5 and 13.5 miles northeast of Brookings, South Dakota (Figure 1). The elevation of the project area ranges from approximately 1,700-1,950 feet (ft). Cultivated agriculture is the dominate vegetation type in the project area (Figure 2). Other significant vegetation types included planted grassland (e.g., Conservation Reserve Program) and disturbed grasslands (this may include native sod areas that are heavily encroached upon by smooth brome grass). There are scattered patches of trees and shrubs planted near farmsteads, tree rows, and other private areas. There are also limited perennial stream and ponds located in the project area. The far eastern edge of the project area

(which includes the proposed wind farm and one-mile buffer) is bisected approximately north to south by Deer Creek and tributaries (Figure 3).

Most or all lands in the project area are privately owned. Portions of these private lands have easements held by the USFWS. Besides the proposed wind farm area, a one-mile buffer was included in the project investigation (project area).

The White Wind Farm is proposed to consist of up to 102 wind turbines with a net capacity of up to 200 megawatts (MW). The most likely turbine size is 2-MW with a rotor diameter of 80-87 meters. The wind turbines will be situated on steel, tubular towers approximately 70-100 meters high and secured to a concrete foundation. Details on turbine layout have not been developed at this time.

II. METHODS

II.A. Agency Consultations

Letters requesting information and comments relating to biological issues (including occurrence of federally listed and candidate species, state listed species, and state rare species in the vicinity of the proposed wind farm development site) were sent to the U.S. Fish and Wildlife Service (USFWS) and the South Dakota Department of Game, Fish, and Parks by HDR Engineering, Inc (Appendix A). The SDGFP replied on November 2, 2004 and the USFWS replied on November 19, 2004 and February 4, 2005 (Appendix B). In addition to these correspondences, representatives from WEST, and/or HDR have had several phone conversations with personnel from both agencies.

II.A. Phase I Screening and USFWS PII

Biological resources in the vicinity of the proposed wind farm area were evaluated by reviewing existing data and visiting the site area. A site visit was conducted on May 11-13, 2005 by biologists from WEST. Correspondence with the USFWS prior to the meeting indicated that they could not attend the meeting due to travel restrictions; however, they were comfortable with WEST conducting the site visit as USFWS staff had currently visited the general project area. During the visit, biological features and potential wildlife habitat, including plant communities, and potential raptor nest structures, were identified and mapped. A list of wildlife species observed during the site visit was recorded (Appendix C).

Several data sources were used to identify biological resources within the project area, including data requested from the South Dakota Natural Heritage Inventory, review of websites, discussions with USFWS and SDGFP personnel, and published literature, field guides, etc. After biological resources in the project area were identified, potential for conflicts with the proposed White Wind Farm area were analyzed based, in part, upon studies conducted at other wind plants throughout the U.S. The Potential Impact Index (PII) score based on the Interim USFWS Guidelines (USFWS 2003) was also developed for the proposed wind farm area.

III. RESULTS

III.A. Phase I Screening

III.A.1 Raptors

Nesting density and species breeding**.** Potential nesting habitats in the project area for above-ground nesting raptor species are present in the form of scattered trees, tree rows, and shelter belts. No cliffs or rock outcrops were identified during the site visit. Based on the reconnaissance-level site visit, it did not appear that the proposed project area supports high densities of above-ground nesting raptors, but extensive searches were not completed. Several small stick nests were documented during the site visit, but few raptors were observed. These nests likely were from Swainson's hawks (*Buteo swainsoni*) and/or red-tailed hawks (*Buteo jamaicensis*). None of the nests were active. No large stick nests from bald eagles (*Haliaeetus leucocephalus*) were observed.

Based on the study conducted at Buffalo Ridge (a portion of the proposed White Wind Farm was used as a reference area), above-ground nesting species most likely to nest within and surrounding the project area include, Swainson's hawk, American kestrel (*Falco sparverius*), and red-tailed hawk (Johnson et al. 2000a). It is also possible that, bald eagle (FWS and SDGFP letter, Appendix B) and great-horned owl (*Bubo virginianus*) could nest in the project area. Ground- or belowground-nesting raptors most likely nesting in the project area includes northern harrier (*Circus cyaneus*).

Raptors that may also occur in the project area during the non-breeding season include those listed above, plus Cooper's hawk (*Accipiter cooperi*), sharp-shinned hawk (*Accipiter striatus*), turkey vulture (*Cathartes aura*), ferruginous hawk (*Buteo regalis*), rough-legged hawk (*Buteo lagopus*), Osprey (*Pandion haliaetus*), peregrine falcon (*Falco peregrinus*), goshawk *(Accipiter gentiles),* and broad winged hawk (*Buteo platypterus*) (Johnson et al. 2000a).

Potential for prey densities**.** No signs of colonial rodents (*e.g.* prairie dogs) were observed during the site visit and none are known to be in the project area. Potential raptor prey sources include isolated ground squirrels and other rodents, rabbits, and waterfowl. Overall, it is very difficult to assess potential prey densities during a single site visit and prey densities can fluctuate rapidly based on habitat and climatic factors. However, overall prey densities are not expected to be significantly different than areas outside of the proposed project area.

Does the topography of the site increase the potential for raptor use? The proposed project area is located in an area dominated by relatively flat to rolling areas separated by ephemeral drainages. Deer Creek and tributaries to Deer Creek generally bisect the far eastern portion of the project area from north to south (Figure 3). This drainage area has a gradual to moderate slope from the top of the ridge to the bottom. The total elevation change is approximately 100-200 feet in this area. At some wind farm sites located on prominent ridges with defined, steep edges (e.g., rims of canyons, steep slopes), raptors are often observed flying along the rim edges, using updrafts to maintain altitude while hunting, migrating, or soaring. For example, at a wind farm site in Wyoming, raptors most often used areas within 50 m of the rim edge (Johnson et al. 2000b). Overall, raptor use is not expected to be heavily influenced by the topography in the

project area because of the lack of steeply defined ridges and rim edges throughout most of the project area. The area along Deer Creek did not appear to contain a significant rim edge such that it would concentrate raptor use in association with "updrafts". In conjunction with this, any updrafts that would occur associated with this feature would likely be on the eastern side of Deer Creek as the predominate wind is from the westerly direction.

Many developed wind farms have documented some level of raptor fatalities (Table 1). Erickson et al. (2001) reported that raptor fatalities averaged 0.033 raptors/turbine/year for nine project areas reviewed. This estimate is reduced to 0.006 raptors/turbine/year if projects in California are removed. A study conducted at the nearby Buffalo Ridge wind farm in southwestern Minnesota (primarily agricultural lands with grasslands/CRP and wetlands) documented one raptor fatality, a red-tailed hawk, during four years of searching 354 turbines (Johnson et al. 2002). Based on the close proximity and similar vegetative and topographic structure at the project area to the existing Buffalo Ridge wind farm area, it is reasonable to expect similarly low raptor mortality at the proposed White Wind Farm.

III.A.2. Federal Species of Concern

In their November 19, 2004 letter, the USFWS identified three threatened or endangered species as potentially occur in the project area: bald eagle, Topeka shiner (*Notropis topeka*), and Western prairie fringed orchid (*Platanthera praeclara*) (USFWS letter, Appendix B). In addition to these threatened and endangered species, the USFWS expressed concern regarding migratory birds, bats, and USFWS easement interests in the project area (USFWS letters, Appendix B). Besides these species identified by the USFWS, the SDGFP identified the federally endangered whooping crane as potentially in eastern South Dakota (SDGFP letter, Appendix B).

Bald Eagle (Threatened). The USFWS notes that bald eagles could potentially be observed throughout South Dakota at any time of the year (Appendix B). Wintering bald eagles are often associated with lakes, rivers, and reservoirs where they feed primarily on fish (Johnsgard 1990). Eagles have been known to concentrate during the winter along the Missouri River. Bald eagles may also be found during migration and winter periods in areas away from major rivers if sufficient forage (e.g., carrion) is available. Like most raptors, bald eagles are potentially found in the project area during migration.

Bald eagles nest in areas with mature forest, typically along major waterways, lakes, and reservoirs. However, with increasing bald eagle populations, nesting eagles are also being found in areas away from "major" waterbodies. The USFWS and SDGFP state that there are no known bald eagle nests in the vicinity of the proposed wind farm area, but that current surveys have not been completed. There are no large waterbodies in the project area, but limited potential nesting substrate is present within the wind farm area and one-mile buffer in the form of scattered mature cottonwood trees. All mature trees observed from public roads during the May 2005 site visit were scanned for potential bald eagle nests and none were observed.

It is possible for bald eagles to occur in the project area, particularly during migration. However, WEST is unaware of any documented bald eagle fatalities at wind power facilities (Erickson et al. 2001, Erickson pers. comm.), even when bald eagles are known to nest within relative close proximity of wind farms (e.g., nest within 5-miles of the Foote Creek Rim wind farm site both

before and after turbine construction). Impacts to bald eagles from the proposed project are unlikely.

Whooping Crane (Endangered). The whooping crane is an endangered bird with a total population of over 200 birds as of March 2005 (Martha Tacha, USFWS Whooping Crane Migration Coordinator, pers. comm.). Whooping cranes typically migrate from their breeding grounds in Wood Buffalo National Park, Canada to their wintering areas in Aransas National Wildlife Refuge, Texas. During the migration, most birds pass through central South Dakota (Austin and Richert 2001). There were 139 confirmed observations of whooping cranes in South Dakota between 1943 and 1999, with most occurring along the Missouri River valley. However, there have been confirmed observations of whooping cranes through numerous other areas of South Dakota (including some eastern counties), but none have been confirmed in Brookings County (Austin and Richert 2001). Overall, the project area contains very little potential migratory habitat for whooping cranes (e.g., palustrine wetlands, wet meadows). The South Dakota Natural Heritage Database review (SDGFP letter, Appendix B) did not contain any records of whooping cranes occurring within the project area.

The potential exists, although extremely remote given their very low numbers and that the main flyway is well west of the project, for whooping cranes to fly through the area during migration. Given the remote chance that a whooping crane will fly through the project area and the very limited potential migratory habitat within the project area, impacts to whooping cranes from the proposed project are unlikely.

Topeka Shiner (Endangered). According to the USFWS Topeka shiner web page (http://mountain-prairie.fws.gov/species/fish/shiner/facts.htm), the Topeka shiner is a small, silvery minnow (typically less than three inches in total length) that occurs primarily in small prairie, or former prairie, streams. Within these streams the shiner resides in pools containing clear, clean water with clean gravel, rock, or sand bottoms. Most streams containing Topeka shiners are perennial, but some may be ephemeral. In the small ephemeral streams, the shiners will survive in small pools maintained by groundwater seepage. The historical range of the shiner included portions of Iowa, Minnesota, Kansas, Missouri, Nebraska, and South Dakota.

The Topeka shiner is known to occupy numerous small streams within eastern South Dakota, including Deer Creek which runs through the eastern part of the study area and Six-Mile Creek which run north of the City of White (USFWS and SDGFP letters, Appendix B). The USFWS noted that direct impacts on the Topeka shiner are unlikely as turbines are to be placed in upland areas. However, to minimize indirect impacts due to stream crossings or increased sedimentation from construction, the USFWS recommends further coordination for guidance in developing Best Management Practices.

Western Prairie Fringed Orchid (Threatened). The Western prairie fringed orchid has narrow leaves with a flower stalk that can reach 47 inches tall. Each of these flower stalks can contain up to 40 white flowers approximating one inch in size. The Western prairie fringed orchid is restricted to areas west of the Mississippi and is currently found in Iowa, Kansas, Minnesota, Nebraska, North Dakota, and Manitoba, Canada (http://www.fws.gov/midwest/endangered/plants/prairief.html). The orchid has not been recently documented in South Dakota (USFWS

letter, Appendix B). Where they do occur, Western prairie fringed orchids are associated primarily with intact, native tall grass prairie, however they have been found in roadside ditches and reclaimed grasslands. Potential habitat within these grassland areas includes mesic upland prairies (moist areas in upland sites), wet prairies, sedge meadows, subirrigated prairies, and swales in sand dune complexes.

During the May 2005 site visit a general vegetation map of the study area was developed (Figure 2). This map identifies areas of tilled agriculture, planted grassland (e.g. CRP), rural developed area, disturbed grassland, drainages (perennial and ephemeral), and other vegetation/land use types. By defining potential orchid habitat as wet areas within grasslands, the areas identified as drainages contained potential orchid habitat. The wetter portions of these drainages varied from larger wetlands along ephemeral streams, to pockets of wet, hummock type areas, to small wet benches along ephemeral streams. In most areas, the potential habitat is likely strongly impacted by past and current haying, herbicide spraying, grazing, and occasional tilling. This, combined with the fact that there are no known populations of Western prairie fringed orchid in South Dakota, make impacts to the orchid from the proposed project unlikely. To help assure no impacts, the USFWS recommended site specific surveys for this species if turbines, roads, or powerlines are placed in potential orchid habitat (USFWS letter, Appendix B).

Migratory Birds. Most species of migratory birds are protected by the Migratory Bird Treaty Act (MBTA). The USFWS lists 29 birds as species of concern within the Prairie Pothole Region (USFWS 2002). Most of these species do not receive special protection beyond the MBTA, but they have been identified as vulnerable to population decline in the area by the USFWS. The Interim USFWS Guidelines use migratory birds and potential impacts to them as one factor in the PII score. See Section III.B. for a discussion of the PII score. Johnson et al. (2000a) documented a total of 218 species of birds in the Buffalo Ridge study area (which included a reference area that encompassed part of the proposed White Wind Farm). None of these species were listed as endangered on the state or federal lists. Six species observed were state or federally threatened, including bald eagle (only federally listed species), peregrine falcon, common tern, Wilson's phalarope, horned grebe, and loggerhead shrike.

Of the nine project areas and associated studies reviewed by Erickson et al. (2001), all had documented bird mortalities. Data from these studies indicated that there was an average of 2.19 fatalities/turbine/year for all birds (0.033 are raptors). If projects in California are removed, the result is 1.83 fatalities/turbine/year for all birds (0.006 are raptors). More recent studies conducted in the eastern U.S. (Erickson et al. 2001 contained the eastern studies done at the point in time) indicate a similar to slightly higher level of avian mortality, as was summarized by Erickson et al. For example, a wind farm located at Mountaineer, West Virginia, had a bird mortality rate of between 4-5 birds/turbine/year and Buffalo Mountain, Tennessee had a bird mortality rate of 7-8 birds/turbine/year (see Table 1). Total annual impacts from all wind farms, calculated in 2001, were 10,000-40,000 birds. This compares to avian mortality estimates of 60-80 million/year from vehicles, 98-980 million/year for buildings and windows, tens of thousands to 174 million/year for power lines, and 4-50 million/year for communication towers (Erickson et al. 2001). Studies from 1996-1999 at the adjacent Buffalo Ridge wind farm, Minnesota, estimated 0.98 fatalities/turbine/year within the Phase I area; 2.27 fatalities/turbine/year within the Phase II area; and 4.45 fatalities/turbine/year within the Phase III area (Johnson et al. 2002).

When these estimates are based on name-plate MW per year the estimates for Buffalo Ridge are 3.267-5.933 fatalities/year at Buffalo Ridge (Table 1).

Table 1. All bird and raptor fatality estimates for several wind farms in the U.S. Level of confidence in the estimates varies between sites, but the reported estimates are included in the table.

	No.	No.	Birds Fatalities		Raptor Fatalities	
NAME	**Turbines**	**MW**	**/turbine**	**/ MW**	**/turbine**	**/MW**
Altamont, CA[1]	5400	518	0.9	8.1	0.140	1.500
Montezuma Hills, CA[2]	600	60	NA	NA	0.048	0.480
San Gorgonio, CA[3]	2900	300	2.307	9.228	0.010	0.040
Stateline, OR/WA[4]	454	300	1.930	2.555	0.053	0.080
Vansycle, OR[5]	38	25	0.630	0.955	0.000	0.000
Klondike, OR[6]	16	24	1.420	0.947	0.000	0.000
Nine Canyon, WA[7]	37	48	3.590	2.762	0.065	0.050
Foote Creek Rim, WY Phase I and II[8, 9]	72	43	1.500	2.500	0.031	0.052
Foote Creek Rim, WY Phase III[9]	33	25	1.490	1.987	0.042	0.056
Wisconsin (MG&E and PSC) [10]	31	20	1.300	1.970	0.000	0.000
Buffalo Ridge, MN, Phase I[11]	73	22	0.980	3.267	0.012	0.040
Buffalo Ridge, MN, Phase II[11]	143	107	2.270	3.027	0.000	0.000
Buffalo Ridge, MN, Phase III[11]	139	104	4.450	5.933	0.000	0.000
Buffalo Mountain, TN[12]	3	2	7.70	11.55	0.00	0.00
Mountaineer, WV[13]	44	68	4.04	3.00	NA	NA
Top of Iowa, IA[14]	89	80	0.65	0.72	.006	.006

[1]Smallwood and Thelander 2004, [2]Howell et al 1991, [3]McCrary et al. 1986, [4]WEST, Inc. and Northwest Wildlife Consultants, Inc. 2004, [5]Erickson et al. 2000, [6]Johnson et al. 2003, [7]WEST, Inc. and Northwest Wildlife Consultants, Inc. 2003, [8]Young et al. 2003a, [9]Young et al. 2003b, [10]Howe et al. 2002, [11]Johnson et al. 2000a, [12]Nicholson 2001, [13]Kerns and Kerlinger 2004, [14]Kofor et al. 2005

Based on similar general habitat characteristics and species composition at the White Wind Farm, and the developed portion of Buffalo Ridge, it is reasonable to assume that bird fatalities associated with a wind farm developed at the proposed White Wind Farm would be similar to those fatality rates documented at Buffalo Ridge. To help further reduce potential impacts to migratory birds, in particular raptors, the USFWS recommended that overhead power lines, if needed, be constructed in accordance with the current guidelines for preventing raptor electrocutions.

Besides the direct impact of wind turbines on migratory birds (i.e., fatality), concerns have also been raised regarding indirect impacts to breeding birds, however there is uncertainty regarding this degree of indirect impacts. In Minnesota, researchers have found that breeding songbird density on CRP grasslands was reduced in the immediate vicinity of turbines (Leddy et al. 1999), but changes in density at broader scales was not detectable (Johnson et al. 2000a). Several ongoing studies (e.g., Schaffer and Johnson 2004) are further investigating these potential indirect impacts.

Grassland and USFWS Grassland Easements

Vegetation and land use types were mapped from public roads using 2003 aerial photography during the May 11-13, 2005 site visit (Figure 2). Classifications used and acreages within the project area (including one-mile buffer) included: cultivated agriculture (20,155 acres), planted grass (634 acres), disturbed grassland (9,848 acres), drainages (1,094 acres), ponds (55 acres), riparian woodland (55 acres), and developed/woodlot (1,848 acres). Areas of what was classified as "disturbed grasslands" included what appeared to be untilled areas (primarily relatively steep areas) as well as areas that may have been tilled at one time but have reverted to grassland. In both cases, brome grass had heavily invaded the areas and was by far the dominate species. Some areas that may be planted grasslands could have been included in the disturbed grassland category if they were significantly off of the road or if it was not evident that they had been planted recently. No vegetation density surveys were conducted, but visual observations indicated that brome was greater than 90% of the cover in most or all grassland areas. Areas delineated as drainages generally contained grass cover and some of those areas likely included native sod areas.

The USFWS noted that several landowners in the White area are interested in enrolling their native sod areas into the USFWS Grassland Easement program (see FWS letter dated February 4, 2005, Appendix B). In these areas the USFWS pays landowners not to plow or farm these areas as well as not to hay until after July 15 to protect ground nesting birds. The landowners can continue to graze at anytime and the USFWS offers some flexibility for minor disturbances. The USFWS noted that wind turbines can be minor disturbances depending on how they are located. As of February 4, 2005 there were two parcels within the project area that were enrolled or in the process of being enrolled into the Grassland Easement program: T111N, R48W, Sec. 26, S1/2, NE1/4, E1/2NW1/4; and T111N, R48W, Sec. 36. W1/2W1/2, SE1/4NW1/4, and SW1/4SW1/4. Other landowners within the project area have expressed interest in enrolling lands in this program. Coordination with the USFWS will help ensure Navitas and HDR have the most up-to-date information on grassland easements in the project area and will assist in project siting if plans include lands within grassland easements.

III.A.3. State Wildlife Issues

The SDGFP identified four federally listed or state listed species as occurring or potentially occurring in the study area (see SDGFP letter, Appendix B). Besides the federally listed species (see Section III.A.2 for a discussion of whooping crane, bald eagle, and Topeka shiner) the SDGFP identified the Northern redbelly dace as a state threatened species. Northern redbelly dace are found in numerous drainages across the northern U.S. and southern Canada. It is generally found in streams and ponds with cool, clear, sometimes stained water with sand or silt bottoms. The dace is known to occur within Deer Creek, which crosses the project area. Like for the Topeka shiner (see Section III.A.2 above) direct impacts on the dace are unlikely as turbines are to be placed in upland areas. However, to minimize indirect impacts due to stream crossings or increased sedimentation from construction Best Management Practices regarding fueling and erosion control should be followed.

III.A.4. Unique Habitat

The proposed wind farm project area is located in the USFWS designated prairie pothole region, however, there are few remaining lakes or potholes. There are some blocks of potentially native sod (see Figure 2, disturbed grasslands), but these area have been heavily invaded with brome grass. Overall the project area is heavily managed for tilled agriculture and/or grazing.

III.A.5. Wetlands

Information concerning wetlands is based on general field observations and not on formal delineations. Formal wetland delineations and permitting will be completed before construction. Wetlands in the project area are generally limited to fringes of perennial and ephemeral drainages and adjoining low lying areas. Actual wetland sizes vary from a few square feet to several acres.

III.A.6. Bats

There are several species of bats found in South Dakota, including the big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), long-legged bat (*Myotis volans*), eastern red bat (*Lasiurus borealis*), little brown bat (*Myotis lucifugus*), long-eared bat (*Myotis evotis*), western small footed myotis (*Myotis ciliolabrum*), northern myotis (*Myotis septentrionalis*), Townsend's big-eared bat (*Corynorhinus townsendii*), fringed myotis (*Myotis thysanodes*), and one occurrence of Mexican free-tailed bat (*Tadarida brasiliensis*) (http://www.batcon.org/). Johnson et al. (2004) also documented several silver-haired bats (*Lasionycteris noctivagans*) in the Buffalo Ridge wind farm area. The USFWS formerly had listed the long-eared bat, big-eared bat, long-legged bat, and small-footed myotis as candidate species. Based on information from the web site http://nationalatlas.gov/natlas/natlasstart.asp, none of the former candidate species occur in the project area. The species most likely to occur in the White Wind Farm area include: big brown bat, little brown bat, hoary bat, eastern red bat, northern myotis, and silver-haired bat (Johnson et al 2004, http://nationalatlas.gov/natlas/natlasstart.asp). Other species are more common in the Black Hills and Badlands area of South Dakota.

Potential roosting habitat within the wind farm project areas is found in the form of trees and buildings. No caves were observed during the site visit or reported by agency personnel. Bats may forage over the entire project area, although the extent of use is not known.

Bat casualties have been reported from most wind farms where post-construction fatality data are publicly available. Reported estimates of bat mortality at wind farms through 2001 ranged from 0.07 – 10.0 per turbine per year in the U.S. (Table 2). Most of the bat casualties at wind farms have been migratory species that conduct long migrations between summer roosts and winter hibernacula, but mortalities of numerous species have been found (Johnson et al. 2003). Examples of species commonly found as fatalities at windpower facilities include hoary bats, silver-haired bats and eastern red bats. A recent report of bat fatalities at a wind farm in West Virginia included relatively high numbers of red bats, hoary bats, eastern pipistrelle (*Pipistrellus subflavus*) and little brown bats over the course of one year, up to 47.53 bats/turbine/year (Kerns and Kerlinger 2004). The West Virginia site is located on a prominent, relatively narrow ridge in the Appalachian Mountains and may be located within a bat migration corridor. The causes of the relatively high number of migratory bat deaths at some windpower facilities are not well understood. Some researchers have suggested it may be related to the lack or reduction of

echolocation during migration (Johnson 2003). Furthermore, field methods to provide strong quantitative predictions of migratory bat use are lacking.

Table 2. Reported bat fatality estimates for windpower facilities in the U.S (Johnson 2003).

Location	Year	Mean annual mortality	Bat mortalities per turbine	Notes
Buffalo Ridge, MN P1	1999	5	0.07	Adjusted for search biases
Buffalo Ridge, MN P2	1998-2001	289	2.02	Adjusted for search biases
Buffalo Ridge, MN P3	1999-2001	319	2.32	Adjusted for search biases
Wisconsin	1999	34	1.10	Not adjusted for search biases
Foote Creek Rim, WY	1998-2001	138	1.04	Adjusted for search biases
Buffalo Mtn., TN	2001	30	10.0	Not adjusted for search biases
Vansycle, OR	1999	28	0.40	Adjusted for search biases

Due to a lack of information concerning bat migration habits, it is difficult to predict if the proposed project area is located within a bat migration corridor. However, unlike the West Virginia site, the proposed project area does not appear to contain topographic features that may funnel migrating bats. The proposed wind project will likely result in some bat mortality, but the magnitude of these fatalities is difficult to determine. However, because of the close proximity of the White Wind Farm to the Buffalo Ridge project area, it is reasonable to expect bat fatality rates would be similar at the two locations.

III.A.7. Avian Migratory Pathways

Many species of songbirds and waterfowl migrate at night and thus may collide with tall, man-made structures. Although most birds migrate at altitudes greater than those associated with most wind turbines and towers, large numbers of songbirds have been documented colliding with lighted communication towers and buildings when foggy conditions and spring or fall migration coincide. To date, no large mortality events on the same scale as those seen at communication towers have been documented at windpower facilities in North America (Erickson et al. 2001). However, turbines used by many wind developers are getting taller and require lighting by the Federal Aviation Administration; this may increase the risk of collision by nocturnal migrants with wind turbines.

Little is known for certain regarding what landscape cues migratory birds use during migration. For this project, migratory pathways are considered on a continental, regional, and local scale. On a continental scale, the proposed project area is not located near an ocean coast or immediately near a large mountain range (e.g., Rocky Mountains); features that could impact migration on a continental scale. Likewise on a regional scale, the proposed project is located in an area of open, rolling hills. There are not any obvious "funnels" (e.g., gaps in mountains, large river) or other migratory paths (e.g., long ridge lines) leading into or out of the wind farm area that could potentially serve as a migratory path on a regional scale. On a local scale, the smaller streams and associated ridges may serve as a local attractant for migrating song birds to stop over while moving as part of a large "broad front" migration once they are in the project area. These broad front migration events can be episodic (Evans 1998), making them difficult to predict.

The area does not contain significant migratory stopover for waterfowl in the spring and fall, as is often found in the prairie pothole region. There are a few scattered ponds that may attract some local waterfowl.

III.B. USFWS Guidelines and PII Score

The USFWS issued "Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines" in 2003. Application of the guidelines is voluntary. The voluntary guidelines are meant to assist the USFWS and the wind energy industry to locate projects to minimize or avoid wildlife impacts by providing a standardized approach to evaluate proposed project areas against other reference areas.

WEST personnel visited the proposed wind farm project area on May 11-13, 2005 and completed the field portion of the interim guidelines (*i.e.*, physical attribute checklist, ecological attractiveness checklist). Once in the office, WEST completed the remaining worksheets (*i.e.*, species occurrence and status checklist) for determining the Potential Impact Index (PII) scores (Appendix D). The PII developed for this project used the Oakwood Lakes State Park area approximately 15 miles west of the project area as a reference site. Potential species occurrence was based on the general habitat types, bird lists from Buffalo Ridge (Johnson et al. 2000a), South Dakota Breeding Bird Atlas (Peterson 1995), Birds of South Dakota (Tallman et al. 2002) and range guides. Potential bat occurrence is based on range maps located on a government web site (http://nationalatlas. gov/natlas/natlasstart.asp) and a web site maintained by Bat Conservation International (http://www.batcon.org/).

The PII for the proposed wind farm project area was 131. The PII score for the Oakwood Lakes reference site was 197. The Interim Guidelines state that a reference site should be selected such that it has more ecological concerns and a higher score. The Oakwood Lakes State Park area was selected for the reference site because it would likely have a higher PII score than the project site. The reference site is publicly available land located near the project area, "better" habitat for several different species (particularly woodland and lacustrine related species), and a receives special designation in the PII as a state park.

IV. SUMMARY

The purpose of this report is to identify potential conflicts that a wind farm developed in the proposed area could have on wildlife and wildlife habitat. Discussions with state and federal agency personnel, a reconnaissance-level site visit, and review of published and unpublished literature were all used to identify these potential conflicts. The proposed wind farm area is located in an area dominated by cultivated agriculture with areas grasslands. This area provides habitat for numerous species, some of which are identified as species of concern. These species include grassland nesting birds, raptors, and two species of minnows. The proposed wind farm is unlikely to have any direct or indirect impacts on the Topeka shiner or northern redbelly dace, if proper Best Management Practices are followed. Based on existing information from national, regional, and local wind farms, some level of avian impacts are expected. The USFWS recommended that preconstruction monitoring be completed to assist in minimizing impacts to

wildlife. The USFWS also recommended that post-construction mortality studies be conducted to determine the effect of the wind farm on avian species. These studies would help confirm the presumption that direct mortality from this wind farm is likely to be similar to other wind farms in the upper Midwest.

The Interim USFWS Guidelines PII score is used as one tool to combine species use, landscape features, and ecological features into one measurement. The PII score for the proposed White Wind Farm was 131. The score for a reference area located at the Oakwood Lakes State Park area was 197. The White Wind Farm PII score is lower than the Oakwood Lakes State Park reference area, as was expected, because the reference area has potential habitat for more species (woodlands and lakes), has local migratory funnels between the larger lakes, and has a special designation as a state park. The PII score of 131 for the White Wind Farm can generally be attributed to the inclusion of native sod areas, limited wetlands, and streams. These features make it "possible" for several native species of concern to occur in the project area.

Figure 1. White Wind Farm proposed project area.

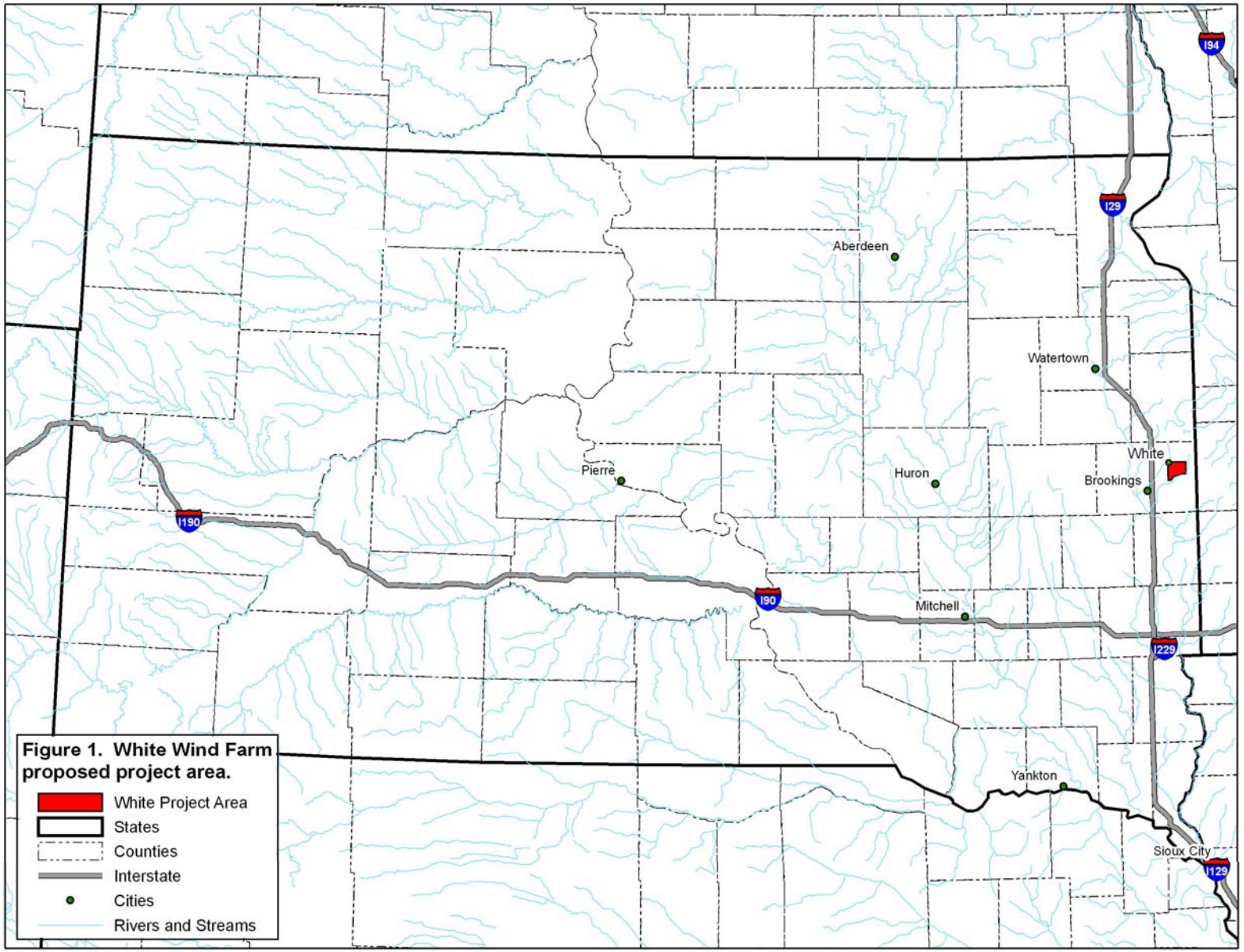


Figure 2. White Wind Farm proposed project area vegetation map.

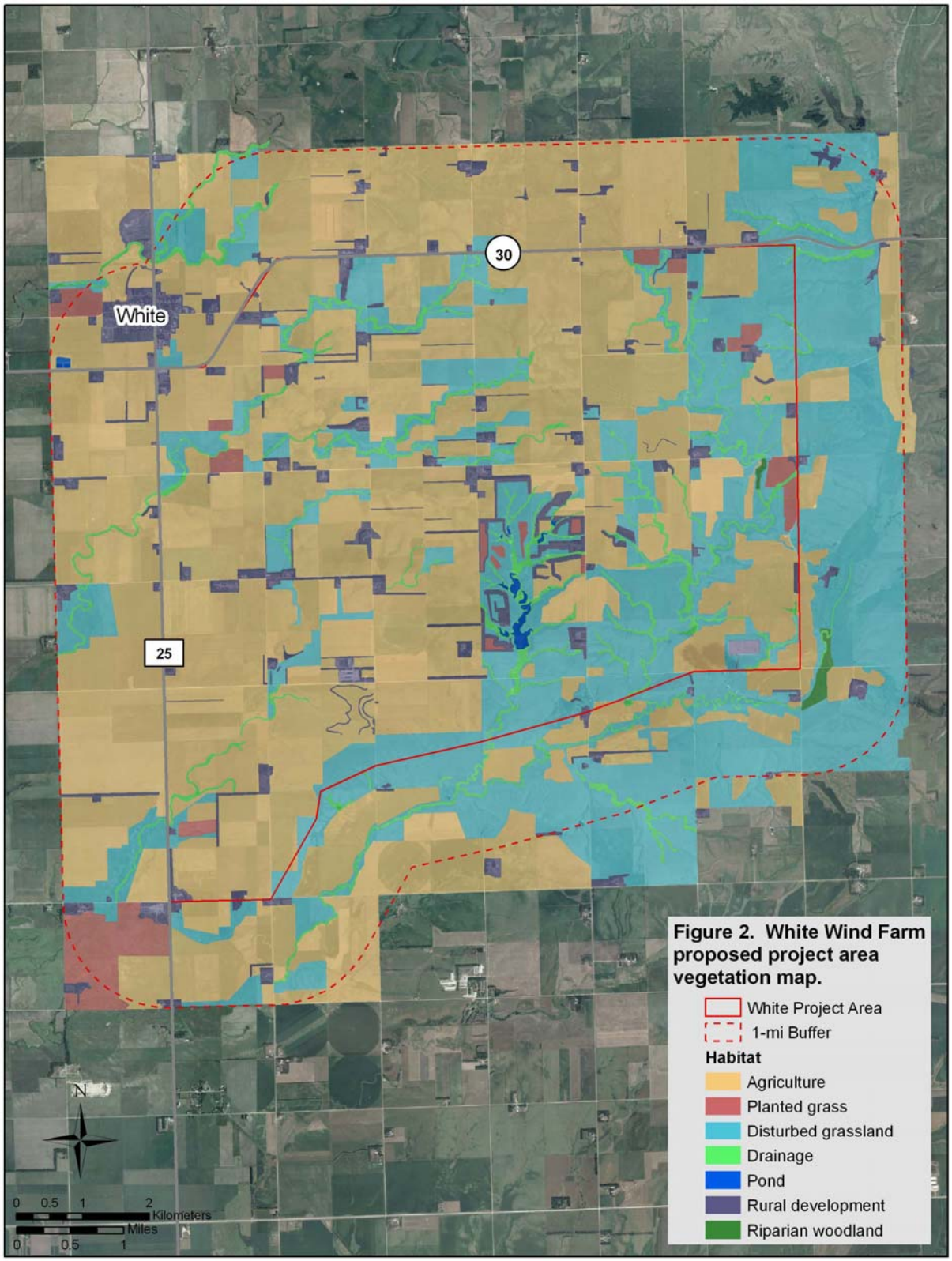
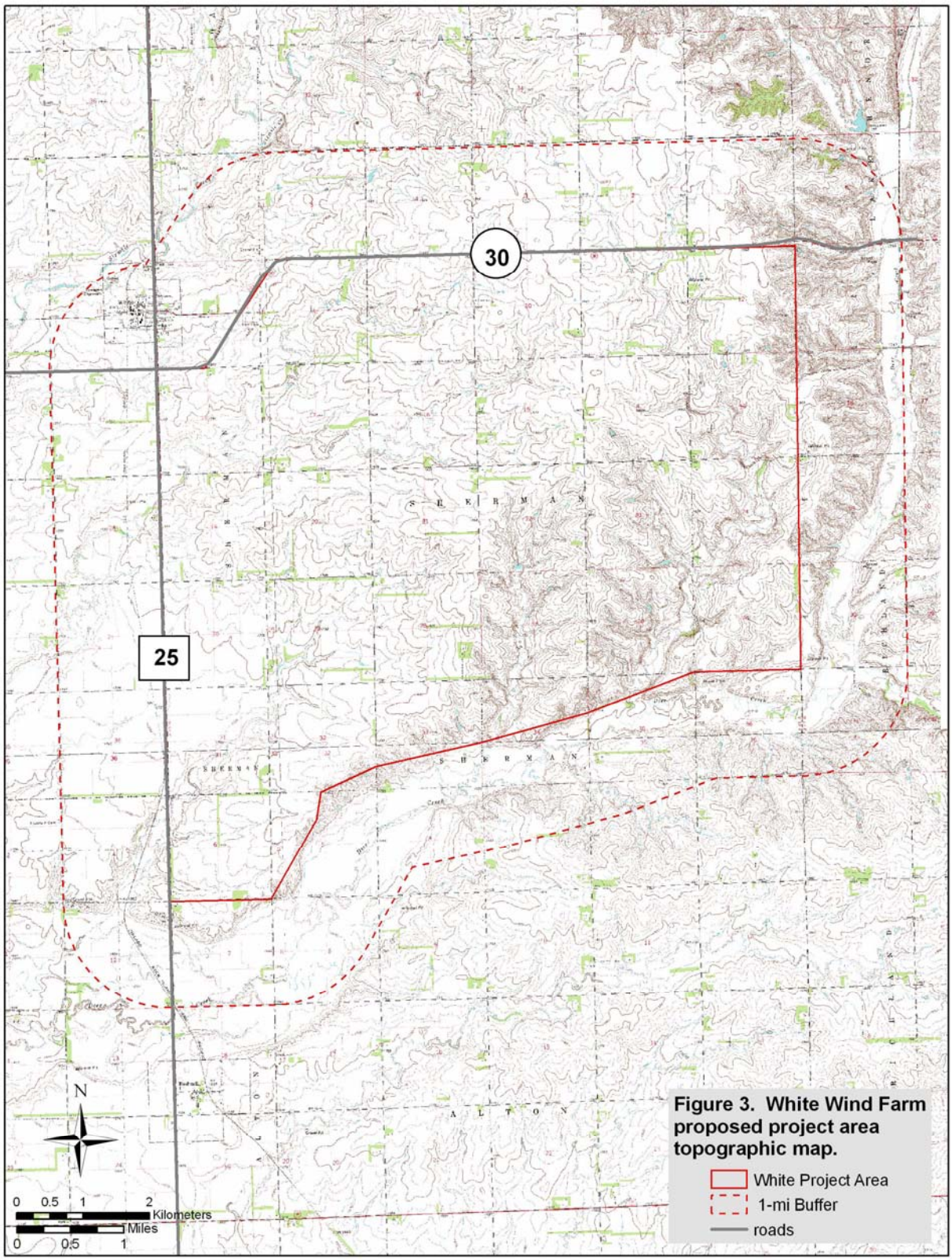


Figure 3. White Wind Farm proposed project area topographic map.



V. LITERATURE CITED

Anderson, R., M. Morrison, K. Sinclair, D. Strickland. 1999. Studying wind energy/bird interaction: a guidance document. Prepared for the Avian Subcommittee and National Wind Coordinating Committee. 87 pp.

Austin, J.E. and A.L. Richert. 2001. A comprehensive review of observational and site evaluation data of migrant whooping cranes in the United States, 1943-1999. Unpublished report prepared for the U.S. Fish and Wildlife Service.

Erickson, W.P., G.D. Johnson, M.D. Strickland, and K. Kronner. 2000. Avian and bat mortality associated with the Vansycle Wind Project, Umatilla County, Oregon: 1999 study year. Technical report prepared for Umatilla County Dept. of Resource Services and Development, Pendleton, OR. 21pp.

Erickson, W.P., G.D. Johnson, M.D. Strickland, K.J. Sernka, and R.E. Good. 2001. Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States. Prepared for the National Wind Coordinating Committee. Available at http://www.west-inc.com

Erickson, W., M.D. Strickland, G. Johnson, D. Young. 2004. Update on bird and bat impacts at wind energy project. Presentation at the 2004 TWS International Conference.

Evans, W.R. 1998. Acoustic detection of nocturnal bird migration at a proposed wind turbine site in north-central Nebraska. Unpublished report to the Nebraska Public Power District.

Howe, R.W., W. Evans, and A.T. Wolf. 2002. Effects of wind turbines on birds and bats in Northeastern Wisconsin. Technical report prepared for the Wisconsin Public Service Commission and Madison Gas and Electric Company. 104 pp.

Howell, J.A., J. Noone, and C. Wardner. 1991. Avian use and mortality study, U.S. Windpoer, wind energy site development, Montezuma Hills, Solano County, California, post construction, spring 1990 to spring 1991. Technical report prepared for Solano County Dept. of Environmental Management, Fairfield, CA.

Johnsgard, P.A. 1990. Hawks, eagles, and falcons of North America: Biology and natural history. Smithsonian Institution Press, Washington D.C.

Johnson, G.D. 2003. What is known and not known about bat collision mortality at windplants? In R.L. Carlton, editor. Avian interactions with wind power structures. Proceedings of a workshop in Jackson Hole, Wyoming, USA, October 16-17, 2002. Electric Power Research Institute, Palo Alto, California. In Press.

Johnson, G.D., W.P. Erickson, M.D. Strickland, M.F. Shepherd and D.A. Shepherd. 2000a. Avian Monitoring Studies at the Buffalo Ridge, Minnesota Wind Resource Area: Results of a 4-year study. Tech. Rept. Prepared for Northern States Power Co., Minneapolis, MN. 262pp.

Johnson, G.D., D.P. Young, Jr., W.P Erickson, C.E. Derby, M.D. Strickland and R.E. Good. 2000b. Wildlife Monitoring Studies, SeaWest Windpower Project, Carbon County, Wyoming, 1995-1999. Prepared for SeaWest Energy Corporation, San Diego, CA, and Bureau of Land Management, Rawlins.

Johnson, G.D., W.P. Erickson, M.D. Strickland, M.F. Shepherd, D.A. Shepherd, and S.A. Sarappo. 2002. Collision mortality of local and migrant birds at a large-scale wind-power development on Buffalo Ridge, Minnesota. Wildlife Society Bulletin 30(3):879-887.

Johnson, G., W. Erickson, J. White, and R. McKinney. 2003. Avian and bat mortality during the first year of operation at the Klondike Phase I Wind Project, Sherman County, Oregon. Technical report prepared for Northwest Wind Power, Goldendale, WA.

Johnson, G.D., M.K. Perlik, W.P. Erickson, M.D. Strickland. 2004. Bat activity, composition, and collision mortality at a large wind plant in Minnesota. Wildlife Society Bull, 32: 1278-1288.

Kerns, J. and P. Kerlinger. 2004. A study of bird and bat collision fatalities at the Mountaineer Wind Energy Center, Tucker County, West Virginia: annual report for 2003. Technical Report prepared for FPL Energy and Mountaineer Wind Energy Center Technical Review Committee.

Kofor, R., A. Jain, G. Zenner. 2005. Avian mortality associated with the Top of Iowa Wind Farm. Progress report calendar year 2004.

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

McCrary, M.D., R.L. McKernan, and R.W. Schreiber. 1986. San Gorgonio wind resource area: impacts of commercial wind turbine generators on birds, 1985 data report. Technical report prepared for Southern California Edison Company. 33pp.

Nicholson, C.P. 2001. Buffalo Mountain Windfarm bird and bat mortality monitoring report: October 2000-September 2001. Tennessee Valley Authority, Knoxville.

Peterson, Richard A. 1995. The South Dakota breeding bird atlas. South Dakota Ornithologists' Union. Jamestown, ND: Northern Prairie Wildlife Research Center Online. kttp://www.npwrc.usgs.gov/resource/distr/birds/sdatlas/sdatlas.htm

Peterson, R.T. 1990. Peterson field guides: western birds. Houghton Mifflin, Boston. 432 pp.

Smallwood, K. S. and C. G. Thelander. 2004. Developing methods to reduce bird fatalities in the Altamont Wind Resource Area. Final Report by BioResource Consultants to the California Energy Commission, Public Interest Energy Research-Environmental Area, under Contract No. 500-01-019 (L. Spiegel, Project Manager).

Tallman, D.A., D.L. Swanson, J.S. Palmer. 2002. Birds of South Dakota. South Dakota Ornithologist's Union. 441 pp.

USFWS (U.S. Fish and Wildlife Service). 2002. Birds of conservation concern 2002. Division of Migratory Bird Management, Arlington, Virginia. 99 pp. [Online version available at <http://migratorybirds.fws.gov/reports/bcc2002.pdf>]

USFWS (U.S. Fish and Wildlife Service). 2003. Service interim guidance on avoiding and minimizing wildlife impacts from wind turbines. Technical memorandum to Regional Directors, Regions 1-7.

Western EcoSystems Technology, Inc. (WEST) and Northwest Wildlife Consultants, Inc. 2003. Nine Canyon wind power project avian and bat monitoring report, September 2002-August 2003. Technical report prepared for Nine Canyon TAC, and Energy Northwest.

Western EcoSystems Technology, Inc. (WEST) and Northwest Wildlife Consultants, Inc. 2004. Stateline wind project wildlife monitoring final report, July 2001-December 2003. Technical report prepared for FPL Energy, Stateline TAC, and Oregon Dept. of Energy.

Young, D.P. Jr., W.P. Erickson, R.E. Good., M.D. Strickland, and G.D. Johnson. 2003a. Avian and bat mortality associated with the initial phase of the Foote Creek Rim windpower project, Carbon County, Wyoming. Technical report prepared for Pacificorp, Inc., Portland, OR, SeaWest Windpower Inc., San Diego, CA, and BLM, Rawlins District Office, Rawlins, WY.

Young, D.P. Jr., W.P. Erickson, M.D. Strickland, R.E. Good, and K.J. Sernka. 2003b. Comparison of avian responses to UV-light-reflective paint on wind turbines. Subcontract report to NREL, Golden CO.

APPENDIX A
Letters Sent to the USFWS and SDGFP by HDR Engineering

October 25, 2004

Ms. Natalie Gates
U.S. Fish and Wildlife Service
Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408

RE: White 200 MW Wind Farm in Brookings County, South Dakota

Dear Ms. Gates:

HDR Engineering, Inc. (HDR) is currently gathering environmental information for a 200 MW Wind Farm proposed by Navitas Energy in Brookings County, South Dakota. Navitas Energy has applied to interconnect the wind farm with Western Area Power Administration's (Western's) power system near White, South Dakota. HDR will submit the environmental information to Western to support Western's environmental review required under the National Environmental Policy Act (NEPA). Western must meet it requirements under the NEPA before granting the interconnection. HDR requests your review of the above-mentioned project for potential effects to known federally-listed threatened or endangered species and rare natural features. This request is made pursuant to Section 7 of the Endangered Species Act of 1973, as amended.

Typically wind facility construction includes erecting wind turbines and constructing associated facilities such as gravel access roads and underground and overhead transmission lines. Although final turbine locations, access roads and electrical connections have not been determined at this time, the table below identifies sections potentially affected by the project:

Township Name	Township	Range	Sections
Lake Hendricks	111 N	47 W	6, 7, 18
Richland	111 N	47 W	19, 30, 31
Sherman	111 N	48 W	1-36
Afton	111 N	49 W	1, 12, 13, 24, 25, 36
Alton	110 N	48 W	2, 3, 4, 5, 6, 7, 8
Aurora	110 N	49 W	1, 12

Your input on the project will assist Navitas Energy, HDR, Western, and other permitting authorities in their review of this project. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. This notification precedes publication of the environmental documents but does not preclude subsequent review and comment on the documents after publication. Other formal opportunities to comment on the project will follow at a later date when a scoping meeting and public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 591-5434.

Sincerely,

Suzanne Lamb Steinhauer
Environmental Planner

Enclosures:
Project Location Map

Cc: Marcus da Cunha, Navitas Energy
Dirk Shulund, Western Area Power Authority

October 25, 2004

Mr. Doug Backlund
South Dakota Department of Game, Fish and Parks
Foss Building
523 East Capitol
Pierre, SD 57501-3182

RE: White 200 MW Wind Farm in Brookings County, South Dakota

Dear Mr. Backlund:

HDR Engineering, Inc. (HDR) is currently gathering environmental information for a 200 MW Wind Farm proposed by Navitas Energy in Brookings County, South Dakota. Navitas Energy has applied to interconnect the wind farm with Western Area Power Administration's (Western's) power system near White, South Dakota. HDR will submit the environmental information to Western to support Western's environmental review required under the National Environmental Policy Act (NEPA). Western must meet it requirements under the NEPA before granting the interconnection. HDR requests your review of the above-mentioned project for potential effects to known federally- and state-listed threatened or endangered species and rare natural features. This request is made pursuant to Section 7 of the Endangered Species Act of 1973, as amended.

Typically wind facility construction includes erecting wind turbines and constructing associated facilities such as gravel access roads and underground and overhead transmission lines. Although final turbine locations, access roads and electrical connections have not been determined at this time, the table below identifies sections potentially affected by the project:

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Lake Hendricks	111 N	47 W	6, 7, 18
Richland	111 N	47 W	19, 30, 31
Sherman	111 N	48 W	1-36
Afton	111 N	49 W	1, 12, 13, 24, 25, 36
Alton	110 N	48 W	2, 3, 4, 5, 6, 7, 8
Aurora	110 N	49 W	1, 12

Your input on the project will assist Navitas Energy, HDR, Western, and other permitting authorities in their review of this project. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. This notification precedes publication of the environmental documents but does not preclude subsequent review and comment on the documents after publication. Other formal opportunities to comment on the project will follow at a later date when a scoping meeting, public information meetings, and public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 591-5434.

Sincerely,

Suzanne Lamb Steinhauer
Environmental Planner

Enclosures:
Project Location Map

Cc: Marcus da Cunha, Navitas Energy
Dirk Shulund – Western Area Power Authority

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416
Phone (763) 591-5400
Fax (763) 591-5413
www.hdrinc.com

APPENDIX B
Letters Received from the USFWS and SDGFP

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

November 19, 2004

Suzanne Lamb Steinhauer, Environmental Planner
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, Minnesota 55416

Re: White 200 MW Wind Farm in
Brookings County, South Dakota

Dear Ms. Steinhauer:

This letter is in response to your request dated October 25, 2004, for environmental comments regarding the above referenced project involving the construction of a 200-megawatt wind farm by Navitas Energy in Brookings County near White, South Dakota. Your letter states that the interconnection of this proposed turbine site with the Western Area Power Administration's (WAPA) power system near White is the Federal nexus that instigated consultation with our office as per section 7 of the Endangered Species Act, as amended, 16 USC 1531 et seq. A 57-square mile area is the current proposed project area: Sections 6, 7, 18, 19, 30, and 31, Township 111 North, Range 47 West; all of Township 111 North, Range 48 West; Sections 1, 12, 13, 24, 25, and 36, Township 111 North, Range 49 West; Sections 2-8, Township 110 North, Range 48 West; and Sections 1 and 12, Township 110 North, Range 49 West.

The U.S. Fish and Wildlife Service (Service) responded to a previous wind farm proposal (for PPM Energy) in the vicinity of this project submitted by Ms. Michelle Bissonnette of HDR Engineering in July of 2003. Some of the area encompassed by that project proposal overlaps with the current proposal for Navitas Energy. The majority of the comments within that letter apply to the current project and are reiterated herein. Since the PPM Energy project has already been proposed (and perhaps already constructed - our office has not been kept informed of its status), consideration of cumulative effects of wind turbines as a result of this project is appropriate.

The Service's primary concerns regarding wind turbines are collision mortality of birds 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, their use by various species of wildlife, landscape features, prey base, migration corridors, and behavioral patterns. Currently, perhaps the best means of avoiding impacts to wildlife is to avoid high wildlife use areas.

The PPM Energy proposed project area was determined, upon a site visit by Natalie Gates of this office and per conversations with Ms. Bissonnette of HDR Engineering, to be considerably impacted by agriculture, with some grazed property interspersed. Since the current proposed project area is situated immediately to the west of the that site, with some overlap, we surmise the current proposed project area incurs similar land use. Raptors were observed onsite during that visit, and the area topography suggests that it could receive high use by raptors which seem to be particularly vulnerable to wind turbine related mortality. Raptor counts during spring/fall migration prior to construction may be valuable. Additionally, recent studies of grassland nesting birds have shown a tendency for avoidance of areas immediately surrounding turbines. Placement of the turbines within cropland would minimize that concern. We recommend that wildlife use of the area be further evaluated prior to construction and appropriate project modifications made, as necessary, to minimize wildlife impacts. Post construction monitoring is also recommended in order to further understand impacts from wind turbines. Bat collision mortality is often an issue at wind turbine farms. The South Dakota Department of Game, Fish and Parks (SDDGFP) has developed a bat management plan for the State and has been involved with bat/turbine issues at other wind projects in South Dakota. If you have not already done so, we recommend that you contact Ms. Alyssa Kiesow of the SDDGFP at (605) 773-2742 regarding this topic.

As you may be aware, the Service has developed voluntary interim guidelines to assist energy companies in accomplishing the goal of reducing the risk posed by turbines to wildlife. You may access these guidelines on the internet at: http://www.fws.gov/r9dhcbfa/wind.pdf. The guidelines stress the importance of proper evaluation of potential wind turbine development sites, proper location and design of turbines and related facilities, and pre- and post-construction research and monitoring.

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. We recommend that you contact Ms. Jill Shaffer of the Northern Prairie Wildlife Research Center at (701) 253-5547 for more information. Perhaps Navitas Energy would be interested in participating in this research effort.

Some of the information in the Service's wind turbine guidance is similar to our guidelines concerning communication towers. It is our understanding that meteorological towers are often constructed in association with wind turbines and that these structures are often similar in design to typical communication towers: tall, lighted, lattice structured, and guyed. These types of towers can be problematic primarily for avian wildlife as the birds may be drawn to the towers, particularly during inclement weather, and reluctant to leave the lighted area. Mortality results as the birds circle the structure and collide with the guy wires or the lattice of the tower itself. If meteorological towers will be part of the proposed project, we recommend following the guidance set forth in "U.S. Fish and Wildlife Service Interim Guidelines for Recommendations on Communications Tower Siting, Constructions, Operation and Decommissioning" (http://migratorybirds.fws.gov/issues/towers/comtow.html) to minimize the threat of avian mortality.

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. Enclosed you will find a Tower Site

Evaluation Form. If towers other than the turbines themselves are to be constructed, please complete this form and return it to our office.

Although the Service's communication tower 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 Migratory Bird Treaty Act of 1918 (MBTA), as amended, 16 U.S.C. 703 et seq., and the Bald Eagle Protection Act of 1940 (BEPA), 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 BEPA 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.

In accordance with section 7(c) of the Endangered Species Act, 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
Bald eagle (Haliaeetus leucocephalus)	Threatened	Migration, Wintering, Possible Nesting.
Topeka shiner (Notropis topeka)	Endangered	Known Resident.
Western prairie fringed orchid (Platanthera praeclara)	Threatened	Possible Habitat, No Recent Specimens.

Bald eagles could potentially be observed in Brookings County (and throughout the state of South Dakota) any time of the year, including the breeding season. We are currently unaware of any bald eagle nests within Brookings County; however, new nests appear each year. The species' nesting season is January to August. Any nests found within one mile of the project area should be reported to this office.

Topeka shiners are known to occupy numerous small streams within eastern South Dakota, and most are concentrated within the Big Sioux, Vermillion, and James River watersheds. Survey efforts continue to reveal additional inhabited streams. Deer Creek is a known Topeka shiner occupied stream that extends into the proposed project area. Although we recognize that wind turbines will likely be placed on upland sites, we anticipate that installation of associated new electrical lines or construction of roads associated with the turbines could necessitate crossings of Deer Creek and its tributaries or other occupied Topeka shiner streams in Brookings County. If this is the case, additional consultation may be necessary to address impacts to the Topeka shiner, and you should contact this office again for guidance on Best Management Practices to minimize potential impacts to the Topeka shiner once specific information on these structures is obtained.

The Western prairie fringed orchid has not recently been documented in South Dakota. However, it is recognized that the life cycle of the plant often makes it difficult to detect. Populations currently exist in the neighboring states of Nebraska, Minnesota, and North Dakota, and potential habitat may still be found in South Dakota. Although the plant is typically

associated with intact native prairie, the Western prairie fringed orchid has also been found on disturbed sites. Potential habitats generally include mesic upland prairies, wet prairies, sedge meadows, subirrigated prairies and swales in sand dune complexes. If these habitats exist within the proposed wind turbine site, surveys for the Western prairie fringed orchid should be considered prior to construction.

The Federal action agency for this project is the WAPA. If the WAPA, or their designated representative, determines that the project "may adversely affect" listed species in South Dakota, formal consultation should be requested 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. For more information regarding Federal action agency responsibilities as related to section 7 of the Endangered Species Act, please refer to the Service's Endangered Species Act Consultation Handbook which is available online at http://endangered.fws.gov/consultations/index.html.

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 34.

Sincerely,

Pete Gober
Field Supervisor
South Dakota Field Office

Enclosure

cc: NPWRC; Jamestown, ND
(Attention: Jill Shaffer)
Secretary, SDDGFP; Pierre, SD
(Attention: Alyssa Kiesow)

TOWER SITE EVALUATION FORM

1. Location (Provide maps if possible):
   State:_____ County:_____ Latitude/Longitude/GPS Grid:_____
   City and Highway Direction (2 miles W on Hwy 20, etc.)_____
   _____

2. Elevation above mean sea level: _____

3. Will the equipment be co-located on an existing **FCC licensed** tower or other existing structure (building, billboard, etc.)? (y/n)_____ If yes, type of structure:_____
   If yes, no further information is required.

4. If no, provide proposed specifications for new tower:
   Height: _____ Construction type (lattice, monopole, etc.):_____
   _____
   Guy-wired? (y/n)_____ No. bands:_____ Total No. Wires:_____
   Lighting (Security & Aviation):_____
   _____
   _____

If tower will be lighted or guy-wired, complete items 5-19. If not, complete only items 19 and 20.

5. Area of tower footprint in acres or square feet:_____

6. Length and width of access road in feet:_____

7. General description of terrain - mountainous, rolling hills, flat to undulating, etc. Photographs of the site and surrounding area are beneficial:
_____
_____
_____

8. Meteorological conditions (incidence of fog, low ceilings, etc.):_____
_____

9. Soil type(s):_____

10. Habitat types and land use on and adjacent to the site, by acreage and percentage of total:

_____
_____

11. Dominant vegetative species in each habitat type:_____

12. Average diameter breast height of dominant tree species in forested areas:_____

13. Will construction at this site cause fragmentation of a larger block of habitat into two or more smaller blocks? (y/n)_____ If yes, describe:_____

14. Is evidence of bird roosts or rookeries present? (y/n)_____ If yes, describe:_____

15. Distance to nearest wetland area (forested swamp, marsh, riparian, marine, etc.), and coastline if applicable:_____

16. Distance to nearest telecommunications tower:_____

17. Potential for co-location of antennas on existing towers or other structures:_____

18. Have measures been incorporated for minimizing impacts to migratory birds? (y/n)_____ If yes, describe:_____

19. Has an evaluation been made to determine if the proposed facility may affect listed or proposed endangered or threatened species or their habitats as required by FCC regulation at 47 CFR 1.1307(a)(3)? (y/n) _____ If yes, present findings:_____

20. Additional information required:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Madison Wetland Management District
P.O. Box 48
23520 SD HWY 19
Madison, SD 57042
Telephone: (605) 256-2974
Fax (605) 256-9432
Email address: madisonwetlands@fws.gov

February 4, 2005

Brookings County Grassland Easements

Landowners in the following sections have expressed interest in receiving a grassland easement payment:

110-47 Section 6
110-48 Sections 1, 2, 3, 4, 5
111-47 Sections 4, 5, 6, 7, 8, 9, 17, 19, 27, 29, 30, 31, 33
111-48 Sections 22, 23, 24, 25, 26, 27, 34, 35, 36
112-47 Sections 29, 31, 32, 34
112-48 Sections 2, 10, 14, 23, 24, 25, 26, 36

Easements have been purchased on the following:

Section 4-111-47 SE1/4, NW1/4, S1/2S1/2NE1/4
Section 5-111-47 SW1/4, S1/2NW1/4, NW1/4SE1/4
Section 6-111-47 N1/2NW1/4
Section 7-111-47 W1/2, SE1/4
Section 26-111-48 S1/2, NE1/4, E1/2NW1/4
Section 24-111-49 W1/2
Section 32-112-48 N1/2
Section 33-112-48 W1/2
Section 24-112-48 NE1/4
Section 30-112-47 NE1/4SE1/4
Section 2-112-48 E1/2NE1/4, NW1/4NE1/4
Section 7-112-47 N1/2NE1/4
Section 8-112-47 N1/2NE1/4

Process of signing:

Section 36-111-48 W1/2W1/2, SE1/4NW1/4, SW1/4SW1/4

The FWS is primarily interested in protecting native sod in Townships 110, 111, 112 with Ranges 47 and 48.

DEPARTMENT OF GAME, FISH AND PARKS
Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182

November 2, 2004

Suzanne Lamb Steinhauer
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

Suzanne:

As requested, I have searched the South Dakota Natural Heritage Database for records of rare, threatened or endangered species in the project area described in your letter of October 25. There are three records of state or federally listed fish species in that area. The records are listed below.

Species	Location	Township Range	Section	Last Observed	Federal Status	State Status
Northern Redbelly Dace	Deer Creek	111N 48W	17	1952		Threatened
Topeka Shiner	Deer Creek	111N 48W	13 NW4	2000	Endangered	
Topeka Shiner	Six-mile Creek	111N 48W	6 SW4	2000	Endangered	

In addition to these species, there are other federally listed species that potentially could occur in this area. New bald eagle nests are being found every year in South Dakota and there is good habitat for nesting bald eagles in this area. There could be existing bald eagle nests that have not been discovered within the project area. Bald eagles are listed as federally threatened.

Nearly the entire population of whooping cranes (<200) migrates through South Dakota every spring and fall. While most of the whooping cranes migrate through the central and western areas of South Dakota, occasionally they do occur in eastern South Dakota. Whooping cranes are a federal endangered species.

We have very little information the movements of migratory bats or birds in the project area. Bats in particular appear to be vulnerable to wind generators. It is likely that populations of bats use various habitats in the project area, especially woodland and forest habitat. Although we have no records of bat species in the project area, the lack of records does not indicate that bats are absent.

If you have any questions or need additional information, please contact me. My phone is (605) 773-4345.

Sincerely,

Doug Backlund
Wildlife Biologist

APPENDIX C
List of species observed during the May 11-13, 2005 site visit within the project area

COMMON NAME	SCIENTIFIC NAME
American white pelican	*Pelecanus erythrorhynchos*
Double-crested cormorant	*Phalacrocorax auritus*
Killdeer	*Charadrius vociferus*
Upland sandpiper	*Bartramia longicauda*
Ring-necked pheasant	*Phasianus colchicus*
Gray partridge	*Perdix perdix*
Wild turkey	*Meleagris gallopavo*
Meadowlark	*Sturnella neglecta*
American crow	*Corvus brachyrhynchos*
Northern harrier	*Circus cyaneus*
Red-tailed hawk	*Buteo jamaicensis*
Swainson's hawk	*Buteo swainsoni*
Great horned owl	*Bubo virginianus*
Turkey vulture	*Cathartes aura*
American kestrel	*Falco sparverius*
Rock dove	*Columba livia*
Mourning dove	*Zenaida macroura*
Common grackle	*Quiscalus quiscula*
Bobolink	*Dolichonyx oryzivorus*
European starling	*Sturnus vulgaris*
Red-winged blackbird	*Agelaius phoeniceus*
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*
American robin	*Turdus migratorius*
Brown thrasher	*Toxostoma rufum*
American goldfinch	*Carduelis tristis*
Tree swallow	*Tachycineta bicolor*
Barn Swallow	*Hirundo rustica*
Cliff swallow	*Hirundo pyrrhonota*
Lark bunting	*Calamospiza melanocorys*
Red-headed woodpecker	*Melanerpes erythrocephalus*
Northern flicker	*Colaptes auratus*
Lark sparrow	*Chondestes grammacus*
Unidentified sparrow	
Savannah sparrow	*Passerculus sandwichensis*
Vesper sparrow	*Pooecetes gramineus*
Tree sparrow	*Spizella arborea*
House sparrow	*Passer domesticus*
Horned lark	*Eremophila alpestris*
Eastern kingbird	*Tyrannus tyrannus*
Belted kingfisher	*Ceryle alcyon*
Canada goose	*Branta canadensis*
Wood duck	*Aix sponsa*
Mallard	*Anas Platyrhynchos*
Blue-winged teal	*Anas discors*
Great blue heron	*Ardea Herodias*
Fox squirrel	*Sciurus niger*
White-tailed deer	*Odocoileus virginianus*
Raccoon	*Procyon lotor*
White-tailed jack rabbit	*Lepus townsendii*
Cottontail	*Sylvilagus floridanus*

APPENDIX D
USFWS Interim Guidelines PII Scoring Sheets

PHYSICAL ATTRIBUTE CHECKLIST

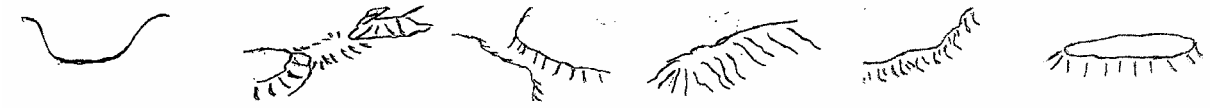
Physical Attribute				Site: White Wind Farm	Site: Oakwood Lakes SP	Site	Site
Topography	Mountain Aspect*	Side	W				
			E				
			N				
			S				
		Top					
		Foothill	W				
			E				
			N				
			S				
	Valley*						
	Pass*						
	Gap*						
	Ridge*						
	Bluff*						
Wind* Direction	S						
	N						
	E						
	W			X	X		
	Updrafts*						
Migratory* Corridor Potential	Latitudinal (N ↔ S)			X	X		
	Longitudinal (E ↔ W)						
	Wide Approaches (>30 km)*						
	Funnel Effect*	Horizontal			X		
		Vertical					
Site Size (acres) & Configuration*	<640			X	X		
	>640 <1000			X	X		
	>1000 <1500			X	X		
	Turbine Rows not Parallel to Migration			X	X		
Infrastructure To Build	Transmission			X	X		
	Roads			X	X		
	Buildings*	Storage		X	X		
		Maintenance		X	X		
		Daily Activity		X	X		
	Substation			X	X		
Increased Activity*				X	X		
			Totals	13	14		

PHYSICAL ATTRIBUTE CRITERIA - 36 categories, max $\sum = 36$.

Topography - Terrain characteristic within the ecological influence of the proposed wind farm, generally, but not restricted to ± 8 km.

Mountain Aspect - Aspect of topography for site of proposed development. Multiple categories may be checked.

Valley Pass Gap Ridge Bluff Butte



Wind Direction - Compass direction *from* which prevailing winds approach. Multiple categories may be checked.

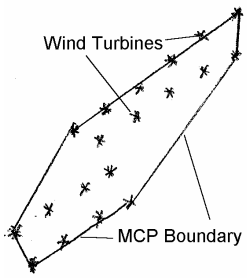
Updrafts - Do updrafts/upslope winds prevail?

Migratory Corridor Potential - Subjective estimate of area to be a potential avian/bat migratory corridor based strictly on topographical characteristics. Multiple categories may be checked.

Wide (>30 km) - Terrain characteristics of approaches to site from each migratory direction, i.e., a large plain, river corridor, long valley. The larger the area that migrant birds/bats are drawn from, the more may be at risk

Funnel Effect - Is the site in or near an area where migrant birds/bats may be funneled (concentrated) into a smaller area, either altitudinally, laterally, or both?

Site Size & Configuration – Size is estimated as if a minimum convex polygon (MCP) were drawn around peripheral turbines.



Successive boxes are checked to convey relationship of larger size = increased impact to birds/bats, *e.g.*, a 700 acre site will have 2 categories checked while a 1200 acre site will have all 3 categories checked.

Configuration of turbine rows is usually perpendicular to prevailing wind direction. Rows aligned perpendicular or oblique to route of migration intuitively presents more risk to birds than rows aligned parallel to movement.

Buildings – Building are categorized by relative size and visitation frequency, *i.e.,* structures that are visited daily are usually larger and present more impact than those that are not. If a "Daily Activity" building is required, all Building categories are checked. If a maintenance structure is required, Storage is also checked.

Increased Activity - Will any type of human activity increase? Sites in urban-suburban or otherwise developed areas (oil, gas, mines) will have less impact on vertebrate wildlife than those in remote or undeveloped areas.

Avian Species of Special Concern Checklist
(Complete prior to SPECIES OCCURRENCE & STATUS CHECKLIST)

Birds (*n* = 29)	**Site**											
	White Wind Farm			Oakwood Lakes SP								
Occurrence[1]	**B**	**M/W**	**∑**	**B**	**M/W**	**∑**	**B**	**M/W**	**∑**	**B**	**M/W**	**∑**
American Bittern	1	1	2	1	1	2						
Northern Harrier	1	1	2	1	1	2						
Swainson's Hawk	1	1	2	1	1	2						
Ferruginous Hawk		1	1		1	1						
Peregrine Falcon		1	1		1	1						
Yellow Rail												
Solitary Sandpiper												
Willet				1	1	2						
Upland Sandpiper	1	1	2	1	1	2						
Long-billed Curlew												
Hudsonian Godwit												
Marbled Godwit	1	1	2	1	1	2						
Sanderling												
White-rumped Sandpiper												
Buff-breasted Sandpiper												
Wilson's Phalarope		1	1	1	1	2						
Black-billed Cuckoo	1	1	2	1	1	2						
Burrowing Owl												
Short-eared Owl												
Red-headed Woodpecker	1	1	2	1	1	2						
Loggerhead Shrike		1	1	1	1	2						
Sprague's Pipit												
Grasshopper Sparrow	1	1	2	1	1	2						
Baird's Sparrow												
Henslow's Sparrow												
Le Conte's Sparrow		1	1		1	1						
Nelson's Sharp-tailed Sparrow												
McCown's Longspur												
Chestnut-collared Longspur		1	1		1	1						
Subtotals												
Total			22			26						

Avian Species of Special Concern Checklist (29 species, max $\sum = 58$)

Column totals of this list are added to appropriate cells in the SPECIES OCCURRENCE & STATUS CHECKLIST. Appropriate avian field guides and species accounts should be consulted for confirmation of species distribution and habitat associations.

In addition to species lists (rows), season of occurrence is also indicated (columns). "B" indicates breeding or summer occurrence and "M/W" indicates presence during migration or as wintering species. The USFWS guidelines for windpower development suggests that if occurrence within or in the vicinity ($\leq$ 7 km) of a proposed site is confirmed or suspected, an "X" is entered. However, due to sharp differences in habitat and topography within 7 km of the proposed project, and X was only entered if it was likely the species would occur or fly through the project area based on topography and habitat features.

NOTE: These species were selected because they are listed as Birds of Conservation concern by the USFWS (2002) within BCR 11 (Prairie Potholes–U.S. portion only). Determinations of occurrence were based on the geographical location of the project area, habitat, Peterson (1995), Johnson et al (2000a), Peterson (1990), and other identification guides.

Bat Species Of Special Concern Checklist
(Complete prior to SPECIES OCCURRENCE & STATUS CHECKLIST)

	Site											
Bats (*n* = 4)	White Wind Farm			Oakwood Lakes SP								
Occurrence	**B**	**M/W**	**∑**	**B**	**M/W**	**∑**	**B**	**M/W**	**∑**	**B**	**M/W**	**∑**
Long-eared Myotis												
Big-eared Bat												
Long-legged Myotis												
Small-footed Myotis												
Subtotals	0	0	0	0	0	0						
Total			0			0						

Bat Species Of Special Concern Checklist (4 species, max ∑ = 8).

Column totals of this list are added to appropriate cells in the SPECIES OCCURRENCE & STATUS CHECKLIST. Appropriate bat field guides and references should be consulted for confirmation of species distribution and habitat associations.

In addition to species lists (rows), season of occurrence is also indicated (columns). "B" indicates breeding or summer occurrence and "M/W" indicates presence during migration or as wintering species. If occurrence within or in the vicinity (≤ 7 km) of a proposed site is confirmed or suspected, an "X" is entered.

NOTE: The Four bat species on this list were included because they are were formerly candidates for listing under the Federal Endangered Species Act in North Dakota (USFWS 1995). Species occurrence was based on the web site http://nationalatlas. gov/natlas/natlasstart.asp and species occurrence information from Bat Conservation International web site http://www.batcon.org/ .

SPECIES OCCURRENCE & STATUS CHECKLIST

Species		Site: White Wind Farm			Oakwood Lakes SP								
	Occurrence	**B**	**M/W**	**∑**	**B**	**M/W**	**∑**	**B**	**M/W**	**∑**	**B**	**M/W**	**∑**
Threatened & Endangered (state and federal)	Whooping Crane			0			0						
	Bald Eagle		X	1	X	X	2						
	Topeka Shiner	X	X	2	X	X	2						
	Northern Redbelly Dace	X	X	2	X	X	2						
	Western Prairie Fringed Orchid			0			0						
Candidate*													
Special Concern*	Birds (max ∑=58)	8	14	22	11	15	26						
	Bats (max ∑=8)	0	0	0	0	0	0						
Bats*			X	1		X	1						
	Subtotals	10	18	28	14	19	33						
	Total			28			33						

SPECIES OCCURRENCE & STATUS CHECKLIST (39 categories, max ∑ = 78)

Checklist totals for each column in "Avian Species of Special Concern List" and "Bat Species of Special Concern List are inserted in this checklist.

Threatened & Endangered Species - Species include in the Federal and State List of Endangered and Threatened Species provided (see attached letters).

Candidate Species - Species being investigated for inclusion in the Federal List of Endangered and Threatened Species. None were described by the USFWS.

Species of Special Concern – Birds of Conservation Concern (USFWS 2002) within BCR 11 were used to generate this list.

Bats (other than bat Species of Special Concern) are included due to generally unknown impacts of wind farms on individual and populations.

ECOLOGICAL ATTRACTIVENESS CHECKLIST

			Site			
Ecological Attractor			White Wind Farm	Oakwood Lakes SP		
Migration Route*		Local	x	x		
	Continental*	N		x		
		S		x		
		E				
		W				
Ecological Magnets*		Lotic System	x	x		
		Lentic System	x	x		
		Wetlands	x	x		
		Native Grassland	x	x		
		Forest		x		
		Food Concentrated		x		
		Energetic Foraging				
	Vegetation/ Habitat	Unique				
		Diverse		x		
Significant Ecological Event*						
Site of Special Conservation Status*				2		
Total			5	12		

ECOLOGICAL ATTRACTIVENESS CRITERIA - 16 categories, max$\sum$ = 17.

Migration Route - Indicates predominate direction of movement of seasonal migrations. Multiple categories may be checked.

Local - Some avian populations move only altitudinally & direction may be East-West (sage grouse, owls, bald eagles).

Continental - Some migratory corridors experience mass movements in only one season/direction annually (*e.g.*, Bridger Mountains autumn eagle migration).

Ecological Magnets - Special, unique, unusual, or super ordinary habitats or conditions within the vicinity of the site that may attract vertebrate wildlife. Lotic systems include small perennial or seasonal creeks to major rivers. Lentic systems include stock ponds to lakes. Multiple categories may be checked.

Vegetation/Habitat - Unique or exceptionally diverse vegetation or habitat in the vicinity may indicate exceptional diversity and abundance of avian species or bats.

Significant Ecological Event - Special, unique, unusual, or super ordinary events that occur or are suspected to occur in the vicinity of the site, *e.g.*, up to one third of the Continental population of Trumpeter Swans visit Ennis Lake, < 4 km from a proposed Wind Resource Area; the Continental migration of shorebirds passes over (many stop) @ Benton Lake National Wildlife Refuge) and up to 2000 golden eagles pass over the Bridger Mountains in autumn. If unknown but suspected a "?" is entered. Specifics regarding the cell are then addressed in the appropriate box of the SITE SPECIFIC COMMENTS sheet to focus follow-up investigation and assist in definition of study objectives.

Site of Special Conservation Status - Any existing or proposed covenants, conservation easements, or other land development limitations intended to conserve, protect, or enhance wildlife or habitat. This criterion is weighted (2 entered if true) because of previous financial or other investment in ecological values. Specifics regarding the easement are then addressed in the appropriate box of the SITE SPECIFIC COMMENTS sheet to focus follow-up attention.

POTENTIAL IMPACT INDEX

	Site							
	White Wind Farm		Oakwood Lakes SP					
Checklist (*p*)[1]	∑	∑/*p*	∑	∑/*p*	∑	∑/*p*	∑	∑/*p*
Physical (36 boxes = 36/130 = 0.28)	13	46	14	50				
Species Occurrence & Status (78 boxes = 78 / 130 = 0.60)	28	47	33	55				
Ecological (17 boxes = 17 / 131 = 0.13)	5	38	12	92				
Totals		131		197				

[1]Proportion of total (130) checklist scores.

SITE SPECIFIC COMMENTS

	Site	
Checklist	White Wind Farm	Oakwood Lakes SP
Physical	Rolling hills with few wetlands and/or waterbodies. No defined aspect.	Strong local funneling potentially between the multiple lakes and wetlands
	Although migration occurs through project area, not likely to be funneled due to continuation of general habitat over larger area	More diverse habitat with large and small wetlands, diverse woodlands, grasslands, crops
	Most or all native sod areas heavily encroached upon by smooth brome grass.	
Species Occurrence	Native sod and/or disturbed grassland areas result in potential for numerous species to be in general area.	Native sod/disturbed grasslands. Large and small wetlands and waterbodies result in higher likelihood of different sp. to occur
		Lakes and woodlands make possibility of bald eagle nesting more likely
Ecological	Some native sod habitats and limited wetlands	Some native sod habitats, wetlands, waterbodies, woodlands
		The numerous wetlands contribute to greater likelihood of area being used as part of the larger migration route for waterfowl in potholes

APPENDIX B
WILDLIFE SPECIES OBSERVED

Appendix B

List of Species Observed During the May 11-13, 2005 Site Visit within the Project Area

COMMON NAME	SCIENTIFIC NAME
American white pelican	*Pelecanus erythrorhynchos*
Double-crested cormorant	*Phalacrocorax auritus*
Killdeer	*Charadrius vociferus*
Upland sandpiper	*Bartramia longicauda*
Ring-necked pheasant	*Phasianus colchicus*
Gray partridge	*Perdix perdix*
Wild turkey	*Meleagris gallopavo*
Meadowlark	*Sturnella neglecta*
American crow	*Corvus brachyrhynchos*
Northern harrier	*Circus cyaneus*
Red-tailed hawk	*Buteo jamaicensis*
Swainson's hawk	*Buteo swainsoni*
Great horned owl	*Bubo virginianus*
Turkey vulture	*Cathartes aura*
American kestrel	*Falco sparverius*
Rock dove	*Columba livia*
Mourning dove	*Zenaida macroura*
Common grackle	*Quiscalus quiscula*
Bobolink	*Dolichonyx oryzivorus*
European starling	*Sturnus vulgaris*
Red-winged blackbird	*Agelaius phoeniceus*
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*
American robin	*Turdus migratorius*
Brown thrasher	*Toxostoma rufum*
American goldfinch	*Carduelis tristis*
Tree swallow	*Tachycineta bicolor*
Barn swallow	*Hirundo rustica*
Cliff swallow	*Hirundo pyrrhonota*
Lark bunting	*Calamospiza melanocorys*
Red-headed woodpecker	*Melanerpes erythrocephalus*
Northern flicker	*Colaptes auratus*
Lark sparrow	*Chondestes grammacus*

COMMON NAME	SCIENTIFIC NAME
Unidentified sparrow	Unidentified sparrow
Savannah sparrow	*Passerculus sandwichensis*
Vesper sparrow	*Pooecetes gramineus*
Tree sparrow	*Spizella arborea*
House sparrow	*Passer domesticus*
Horned lark	*Eremophila alpestris*
Eastern kingbird	*Tyrannus tyrannus*
Belted kingfisher	*Ceryle alcyon*
Canada goose	*Branta canadensis*
Wood duck	*Aix sponsa*
Mallard	*Anas Platyrhynchos*
Blue-winged teal	*Anas discors*
Great blue heron	*Ardea Herodias*
Fox squirrel	*Sciurus niger*
White-tailed deer	*Odocoileus virginianus*
Raccoon	*Procyon lotor*
White-tailed jackrabbit	*Lepus townsendii*
Cottontail	*Sylvilagus floridanus*

APPENDIX C
CULTURAL RESOURCES

Class I Cultural Resources Inventory for the White Wind Farm Project, Brookings County, South Dakota

By
Erika Palmer, B.A.
Michael Madson, M.S., RPA

Prepared for:

Navitas Energy
3001 Broadway Street NE, Suite 695
Minneapolis, MN 55413- 1707

Prepared by:

HDR Engineering Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

HDR Engineering Project Number: 18997

July 2005

1.0 Management Summary

Navitas Energy, Inc. proposes to construct an up to 200-megawatt (MW) wind power plant in eastern Brookings County, South Dakota, southeast of the City of White. Associated project components will include a new substation (adjacent to the existing White Substation owned and operated by the Western Area Power Administration), a series of collector lines and access and maintenance roads. A proposed connection to the White Substation will require the preparation of an Environmental Impact Statement directed by the Western Area Power Administration; in addition, the Western Area Power Administration will also function as the lead federal agency for compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

Based on stipulations outlined in a pending Programmatic Agreement, Navitas sponsored a Class I cultural resources inventory. The inventory included a review of existing cultural resources documentation on file in state repositories, a preliminary architectural history windshield survey within the study area and a review of 19th-century Public Land Survey maps.

The project study area includes approximately 55.5 square miles and largely consists of rural cropland and grazing land. The project area contains nine previously inventoried archaeological resources; two have been determined not eligible and seven have not been evaluated. The project buffer area contains six previously inventoried archaeological resources, one of which has been determined eligible for listing on the National Register of Historic Places; one has been determined not eligible and four have not been evaluated.

In addition, the project area contains two previously inventoried standing structures, neither of which appears to have been evaluated for listing on the National Register of Historic Places. The buffer area contains 196 previously inventoried standing structures, of which 171 are located in the City of White. None of the structures appear to have been evaluated for listing on the National Register of Historic Places.

HDR recommends that Navitas sponsor a Class III cultural resources inventory of the project Area of Potential Effects (APE). The APE will be defined by the Western Area Power Administration as part of a Programmatic Agreement.

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2.0 List of Figures

3.0 List of Tables

4.0 Introduction

Navitas Energy, Inc. (Navitas) proposes to construct an up to 200-megawatt (MW) wind power plant in eastern Brookings County, South Dakota, southeast of the City of White. Associated project components will include a new substation (adjacent to the existing White Substation owned and operated by the Western Area Power Administration), a series of collector lines and access and maintenance roads. A proposed connection to the White Substation will require the preparation of an Environmental Impact Statement (EIS) directed by the Western Area Power Administration (Western); in addition, Western will also function as the lead federal agency for compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

This report documents the background review, windshield survey of standing structures, review of Public Land Survey (PLS) maps and provides some general cultural and environmental background to illustrate the types of resources previously identified and anticipated in the project area. The information summarized in this report will be utilized in the EIS and will assist Navitas' archaeologists and architectural historians as the project moves forward and Class III inventories are conducted to examine potential impacts from project components on cultural resources.

Western coordinates government-to-government consultation with American Indian Nations that may consider the project area within their traditional territory. In addition, Western coordinates consultation with the South Dakota State Historic Preservations Office. The efforts to coordinate with these parties and the results of any consultation, including definition of any Traditional Cultural Places (TCPs), are not included in this report.

Western is currently negotiating a Programmatic Agreement (PA) for the project that will guide the Section 106 process. This PA will provide a framework for any cultural resources activities associated with the project, including a physical definition of the project Area of Potential Effects (APE) and procedures for evaluating properties potentially eligible for listing on the National Register of Historic Places (NRHP).

5.0 Project Background and Inventory Methodology

In Spring 2005, Navitas contracted HDR Engineering, Inc. (HDR) to complete a Class I cultural resources inventory for the proposed White Wind Farm. HDR is also preparing additional environmental documentation for the project to support the EIS. The project area largely consists of rural cropland and grazing land in the sections noted on Table 1 and in Figure 1.

Table 1
White Wind Farm Project Area

TOWNSHIP NAME	TOWNSHIP	RANGE	SECTIONS
ALTON	110N	48W	2-8
AURORA	110N	49W	1, 12
RICHLAND/LAKE HENDRICKS	111N	47W	6-7, 18-19, 30-31
SHERMAN	111N	48W	1-36
AFTON	111N	49W	1, 12-13, 24-25, 36

HDR cultural resources staff Erika Palmer (Archaeologist), Dylan Eigenberger (Cultural Resources Technician), and Michael Madson (Principal Investigator) conducted the Class I inventory and prepared this technical report. Mr. Madson consulted with Western to define the scope of the Class I inventory, which was determined to include a review of previously identified cultural resources and surveys in the project area, a windshield survey of standing structures in the project area and a review of 19th-century PLS maps.

HDR requested previous survey data and information on known cultural resources in the project area from the Archaeological Research Center in Rapid City, South Dakota. HDR acquired PLS maps from the Montana/Dakota Bureau of Land Management (BLM) Field Office in Billings, Montana. General Land Office (GLO) maps were collected from the Montana BLM. HDR also consulted the Archaeological Resources Management System and Cultural Resources Geographic Research Information Display (CRGRID) databases (provided by the State of South Dakota) available on the web from the South Dakota Historical Society in Pierre. Other archival and environmental resources were available at repositories in Minneapolis, Minnesota and on the world-wide web.

6.0 Environment

The project area is on the Coteau des Prairies, a high plateau that extends southeast across Brookings County in east-central South Dakota. The project area is within a nearly level to gently rolling till plain consisting of loamy glacial till. Some areas within the till plain contain a mantel of loess, loamy eolian material or sandy material. Elevation figures reflect the gentle rolling nature of the landscape; the elevations in the project area range from approximately 477 meters to 606 meters above mean sea level (amsl) (Schaefer 1959).

The four primary soil associations (Vienna-Lismore-Kranzburg, Lamoure-Ludden-Lowe, Fordville-Renshaw-Southam and Buse-Sioux-Poinsett) in the project area consist of

excessively drained to poorly drained silt, clays and loams on flat to rolling terrain (Schaefer 1959). Since relatively intensive Euroamerican settlement in the latter decades of the 19th-century, these associations have supported an economy based on agriculture and animal husbandry. Currently, farms in the project area depend on the sale of livestock and livestock products and from the sale of crops such as corn, soybeans and small grains.

7.0 Cultural Background

The cultural background presented here provides a brief glimpse of prehistoric and historic-period land use in the region derived from Anfinson 1997, DeMallie 2001 and Zimmerman 1985. The activities represented here may have occurred in the project area. The dates of traditions are approximate and are presented to provide very general progressions of land use in the project area.

During the Paleoindian Tradition (approximately 12,000-6,000 Before Present (B.P.)) small nomadic, highly mobile groups followed large game such as bison and the now extinct mega-fauna such as the mastodon. In addition to large game hunting, these groups most likely utilized the wide variety of small and medium sized mammals as well as fish and plant resources where available. Lithic tools included fluted and lanceolate projectile point types such as Clovis and Folsom. Throughout much of this period, beginning with the end of the last glaciation, the climate grew successively warmer and drier.

Different lithic tool and point typologies, namely side notched-projectile points and ground stone tools, are associated with the Prairie Archaic Tradition (approximately 6000-3000 B.P.). Rather than following completely nomadic life-ways, groups were semi-nomadic and continued hunting and gathering typically in a seasonal round of resource procurement. The continued reliance on large game hunting, such as bison, and increasingly diversified technologies associated with hunting, trapping, fishing, foraging, wood working and plant processing are activities that generally characterize the Prairie Archaic Tradition. The diversification of culture and associated technologies reflects more highly regionalized adaptations to specific or local environmental settings as climatic conditions became cooler and wetter.

During the Plains Woodland Tradition (approximately 3000-1200 B.P.) ceramic vessels first appeared and earthworks were constructed. Earthworks of the Woodland Tradition included low, circular or conical mounds, usually near water sources, which could contain burials (but not in all examples). Generally few or no grave goods are associated with Woodland Tradition burials. The development of horticultural practices appeared near the end of the Woodland Tradition; hunting and gathering of regional resources also continued.

The Plains Village Tradition (approximately 1200-300 B.P.) demonstrates Plains variations of Mississippian customs. By 1100-1000 B.P., new cultural patterns appeared in the Mississippi River Valley of the central United States. Sedentary villages, river bottom agriculture, flat-top ceremonial mounds, triangular projectile points and advanced ceramic designs and decoration characterized this tradition. Influences from the Mississippian cultures were felt during the Plains Village Tradition. Villages during the Plains Village Tradition were permanent and sometimes fortified. Other similarities included river bottom agriculture, burial mounds, straight sided and side-notched triangular projectile points and some selected ceramic traits. Near the end of this tradition, Siouan-speaking peoples entered Arikara territory in southeastern South Dakota and culture tribal boundaries began to change.

The Historic Period (approximately 300 B.P. to present) marks the influx of European influence to the plains. Prior to the arrival of Europeans and Euroamericans on the plains, various trade goods, such as guns and brass and iron kettles, were already traded among Native American groups. By the early to mid-1700s, French fur traders made contact with the Arikara in the region; between 1750 and 1800, European and Euroamerican settlement/land use, in what is now South Dakota, increased dramatically. It was also during this time that the Arikara began loosing economic independence and the death rate soared due to introduced disease. With increased pressure from both the Sioux and the Europeans, the Arikara traveled north to the traditional lands of the Mandan and Hidatsa in North Dakota.

The earliest recorded European in the Brookings area was French fur-trader Joseph LaFramboise. Near present day Flandreau, approximately 15 miles southeast of White, LaFramboise operated a trading post from 1822 to 1827 (Brookings County 2005).

The first permanent Euroamerican settlements in South Dakota came during the 1850s with the arrival of land speculators and farmers from Minnesota and Iowa. The first town in Brookings County was Medary, established in 1857; Medary, on the southern border of Brookings County approximately 15 miles southwest of White, was among the first Euroamerican settlements in South Dakota (Brookings County 2005). Medary was abandoned in 1858 after a large band of Yankton and Yanktonnia drove settlers out of the area. The area remained abandoned for nearly 11 years until a small group of Norwegian pioneers moved into the Dakota Territory, which included North and South Dakota, eastern Wyoming and eastern Montana, in 1869 and resettled the area (Brookings County 2005).

By the 1870s railroads were rapidly approaching South Dakota. In the later decades of the 19th-century, railroad mainlines and spur lines reached Aurora, Brookings, Volga and White. In 1879, Brookings was surveyed and platted, creating an influx of business

and travelers. European émigrés from Germany, England, Ireland and Norway arrived with Euroamericans from Eastern and Midwestern states. The settlement of White in the later decades of the 19th-century, perhaps encouraged by the laying of the Chicago, Rock Island and Pacific Railroad alignment through town (now abandoned), provided a civic base for the area's farmers that continues to the present day.

8.0 Previous Archaeological Resources Investigations and Identified Archaeological Sites

A review of the South Dakota Archaeological Research Center files indicated that eight cultural resources investigations had been completed in the project area (Table 2).

Table 2
Previous Cultural Resources Investigations in the Project Area

SURVEY REPORT DATE	REPORT TITLE	AUTHOR (ASSOCIATION)
1973	*An Archaeological Survey of the Proposed Watertown, South Dakota – Moville, Iowa 345 kV Transmission Line*	John S. Sigstad (University of South Dakota)
1978	*A Cultural Resource Survey of the Proposed Wastewater Treatment Plant for White, South Dakota – First Survey*	Patte Burns and James Tudehope (University of South Dakota Archaeology Laboratory)
1978	*A Cultural Resource Survey of the Proposed Wastewater Treatment Plant for White, South Dakota – Second Survey*	Ned Hanenberger and James Tudehope (University of South Dakota Archaeology Laboratory)
1982	*Class III Cultural Resource Investigation, Brookings – White 230 kV Transmission Line*	Newkirk (Western Area Power Administration)
1989	*An Intensive Cultural Resource Survey of Portions of the Proposed Sioux Valley Electric Two-Year Construction Plan in Eastern South Dakota*	Edward J. Lueck (Augustana College Archaeological Laboratory)
1994	*An Intensive Cultural Resources Survey of Proposed Sioux Valley Electric Projects in Eastern South Dakota*	Timothy V. Gillen, Edward J. Lueck, and R. Peter Winham (Augustana College Archaeological Laboratory)
1997	*An Intensive Cultural Resources Survey of Sioux Valley Southwestern Electric Company's Proposed 1997 Underground Cable Installation in T111N and T112N, R48W, Brookings County, South Dakota*	Timothy V. Gillen (Augustana College Archaeological Laboratory)

SURVEY REPORT DATE	REPORT TITLE	AUTHOR (ASSOCIATION)
2000	*A Letter Report on an Intensive Cultural Resource Survey of an Emergency Bridge Replacement Project, BRO 8006(3) PCEMS 032M, Brookings County, South Dakota.*	Calvin Long and James A. Donohue

According to the South Dakota Archaeological Research Center files, 15 cultural resources have been identified within the project and buffer area (Figure 2). The project area contains nine previously inventoried archaeological resources; two have been determined not eligible and seven have not been evaluated. The buffer area contains six previously inventoried archaeological resources, one of which (39BK2016) has been determined eligible for listing on the National Register of Historic Places; one has been determined not eligible and four have not been evaluated.

Table 3
Previously Identified Archaeological Resources in the Project / Buffer Area

SITE NUMBER	SITE TYPE	PROJECT/BUFFER AREA	NRHP STATUS
39BK6	Prehistoric lithic scatter	Buffer	Not Evaluated
39BK10	Faunal remains (unknown cultural affiliation)	Buffer	Not Evaluated
39BK14	Prehistoric lithic scatter	Buffer	Not Evaluated
39BK15	Prehistoric lithic scatter	Project	Not Evaluated
39BK16	Granary	Project	Not Evaluated
39BK58	Prehistoric isolated find	Project	Not Eligible
39BK64	Prehistoric isolated find	Project	Not Eligible
39BK65	Possible historic Indian artifact scatter	Project	Not Evaluated

Two archaeological surveys of the proposed White Wastewater Treatment Plant in 1978 identified a prehistoric lithic scatter (39BK6) with possible Woodland or Village tradition artifacts (Burns and Tudehope 1978; Hanenberger and Tudehope 1978). This site has not been evaluated to determine eligibility for listing on the NRHP.

Western completed a Class III archaeological field survey for the Brookings to White transmission line in 1982 (Newkirk 1982). The alignment crosses the southern portion of the project area (Figure 2). During the survey three previously unrecorded cultural resources were identified. Two of the recorded sites consisted of prehistoric lithic scatters (39BK14 and 39BK15), while the third site was a collapsed granary (BK16). None of the sites have been evaluated to determine eligibility for listing on the NRHP.

Between 1989 and 1997 the Augustana College Archaeological Laboratory completed three archaeological resources surveys for Sioux Valley Electric. Lueck (1989) completed a cultural resources survey for Sioux Valley electric in Minnehaha, Moody, Lake, Brookings and Deuel counties of eastern South Dakota. No cultural resources were identified within the Brookings County portion of the survey along the southern border of Section 25 in Sherman Township. Gillen et al. (1994) performed an additional cultural resources survey that included portions of the project area. Seven archaeological resources were identified during the survey. Identified sites included three prehistoric isolated finds (39BK58, 39BK64, and 39BK71), one possibly historic-period Native American artifact scatter (39BK65), two prehistoric artifact scatters (39BK68 and 39BK69), one historic-period school foundation (39BK70) and one historic-period farmstead (39BK72). The three isolated finds are considered not eligible for listing in the NRHP; the remaining sites have not been evaluated to determine eligibility for listing on the NRHP. Gillen (1997) surveyed a proposed underground cable alignment in Sherman Township. The survey identified 39BK75, a prehistoric lithic scatter. The site has not been evaluated to determine eligibility for listing on the NRHP.

A collection of faunal remains (in a channeled section of Deer Creek) were apparently reported to the State Archaeological Research Center in 1978. The site (39BK10) has not been formally investigated and, therefore, its NRHP status has not been evaluated.

Finally, the grade of the north-south Chicago, Rock Island and Pacific Railroad (39BK2016) is in the buffer area and is considered to be eligible for listing in the NRHP.

9.0 Architectural History Resources (CRGRID and Windshield Survey)

In April 2005 HDR performed a windshield survey along public roads in the project area. The project area contains a large number of structures that are over 45 years of age,

either located individually on the landscape or associated with other contemporary or modern structures as part of a complex. Standing structures in the project area (outside of the city of White) are primarily active and abandoned agricultural complexes (residences and outbuildings including corn cribs, barns and sheds) (Figure 3). The complexes have windrows and other landscaping elements typical of late 19th and 20th century farmsteads. Other structures include bridges over drainages and light industrial buildings such as machine shops. The windshield survey of City of White identified residential, commercial and civic structures and light industrial and agricultural buildings constructed in the late 19th century and throughout the 20th century. Information gathered during the windshield survey will be incorporated into additional field documentation gathered for the Class III cultural resources inventory.

HDR consulted the CRGRID database to determine the nature of historic structures that have been inventoried in the project area. CRGRID indicated that the project and buffer area currently contains 198 previously inventoried historic architectural resources. The nature of the surveys supporting these investigations is currently unclear.

The City of White is within the buffer area and contains 171 properties, mostly private residences and commercial buildings (Table 4 and Figure 4). Construction dates range from 1886 to 1965.

Table 4
Previously Inventoried Historic Structures in the City of White

SITE NUMBER	SITE TYPE	ADDRESS	ESTIMATED CONSTRUCTION DATE
BK-000-01102	Abandoned buildings	N/A	1915
BK-000-01103	Abandoned farm building	N/A	1920
BK-000-01104	Commercial building	N/A	1915
BK-000-01105	Abandoned (type unknown)	N/A	1915
BK-000-01106	Abandoned building	N/A	1910
BK-000-01107	Residence	406 Hwy 25	1910
BK-000-01108	Residence	301 Hwy 25	1915
BK-000-01110	Residence	107 Hwy 25	1920
BK-000-01120	Residence	Hwy 25	1915
BK-000-01262	Residence	207 Madison Avenue	1930
BK-000-01378	Jail	N/A	N/A
BK-000-01379	Residence	102 Third Street	1897
BK-000-01380	Residence	300 Madison Avenue	1935
BK-000-01635	Residence	208 Madison Avenue	1920
BK-000-01701	Residence	108 Lincoln Avenue	1920
BK-000-01729	Residence	410 Main	N/A

SITE NUMBER	SITE TYPE	ADDRESS	ESTIMATED CONSTRUCTION DATE
BK-000-01753	Water Works	Lincoln Avenue	1941
BK-000-01769	Residence	Lincoln Avenue	1905
BK-000-01777	Residence	205 Lincoln Avenue	1939
BK-000-01778	Residence	206 Madison Avenue	1925
BK-000-01780	Residence	207 Lincoln Avenue	1925
BK-000-01781	Residence	208 Lincoln Avenue	1910
BK-000-01785	Residence	204 Madison Avenue	1928
BK-000-01787	Residence	202 Madison Avenue	1949
BK-000-01813	Residence	207 Main Avenue	1941
BK-000-01815	Quincey, W. A.	107 Main Avenue	1915
BK-000-01816	Residence	Main Avenue	1920
BK-000-01817	Abandoned Commercial	Main Avenue	1910
BK-000-01818	Abandoned School House	Madison Avenue	1910
BK-000-01819	Residence	Madison Avenue	1928
BK-000-01820	Residence	105 Madison Avenue	1890
BK-000-01821	Residence	107 Madison Avenue	1920
BK-000-01822	Residence	Madison	1920
BK-000-01825	Residence	105 West First Street	1960
BK-000-01826	Commercial (#2)	300 West First Street	1915
BK-000-01827	Commercial (#1)	300 West First Street	1929
BK-000-01828	Commercial	311 West First Street	1910
BK-000-01829	Commercial	309 West First Street	1920
BK-000-01830	Commercial	305 West First Street	1915
BK-000-01833	Commercial	223 West First Street	1921
BK-000-01835	Abandoned Commercial Site	West First Street	1910
BK-000-01837	Grain Elevator (#1)	West First Street	1910
BK-000-01838	Commercial	200 West First Street	1920
BK-000-01839	Commercial	215 West First Street	1910
BK-000-01840	Commercial	West First Street	1915
BK-000-01841	Residence	115 West First Street	1950
BK-000-01846	Residence	111 West First Street	1915
BK-000-01848	Residence	108 West First Street	1905
BK-000-01849	Residence	408 First Street	1910
BK-000-01850	Residence	110 West First Street	1910
BK-000-01851	Residence	112 West First Street	1910
BK-000-01852	Commercial	210 West First Street	1905
BK-000-01853	Commercial	212 West First Street	1905
BK-000-01854	Commercial	214 West First Street	1905
BK-000-01855	Commercial	216 West First Street	N/A
BK-000-01856	Post Office	220 West First Street	1900s

SITE NUMBER	SITE TYPE	ADDRESS	ESTIMATED CONSTRUCTION DATE
BK-000-01857	Commercial	222 West First Street	N/A
BK-000-01858	Commercial	224 West First Street	1910
BK-000-01859	McKnight Community Center	West First Street	1965
BK-000-01860	Commercial	323 West First Street	1910
BK-000-01861	Commercial	314 West First Street	1925
BK-000-01862	Residence	109 West First Street	1915
BK-000-01863	Residence	410 West First Street	1910
BK-000-01864	Residence	412 West First Street	1910
BK-000-01865	Residence	514 West First Street	1925
BK-000-01866	Residence	500 West First Street	1890
BK-000-01867	Residence	509 West First Street	1916
BK-000-01868	Residence	507 West First Street	1965
BK-000-01869	Residence	505 West First Street	1905
BK-000-01870	Residence	503 West First Street	1920
BK-000-01871	Commercial	West First Street	1950
BK-000-01872	Grain Elevator (#2)	West First Street	1920
BK-000-01873	Commercial	310 West First Street	1905
BK-000-01875	Residence	103 West First Street	1920
BK-000-01900	Residence	103 East First Street	1920
BK-000-01901	Residence	101 East First Street	1910
BK-000-01904	Residence	105 East First Street	1915
BK-000-01905	Residence	107 East First Street	1920
BK-000-01911	Residence	East First Street	1925
BK-000-01912	Residence	205 East First Street	1915
BK-000-01914	Residence	203 East First Street	1915
BK-000-01915	Residence	201 East First Street	1905
BK-000-01916	Residence	301 East First Street	1951
BK-000-01917	Duebrook High School	N/A	1909
BK-000-01920	Residence	107 West First	1910
BK-000-01923	Residence	109 East First Street	1925
BK-000-01924	Residence	306 Third Street	1924
BK-000-01925	Lutheran Church (#1)	108 Third Street	1890
BK-000-01926	Woodard, Charles	101 West Third Street	1905
BK-000-01927	Residence	107 West Third Street	1920
BK-000-01928	Residence	109 Third Street	1910
BK-000-01929	Church	111 Third Street	1886
BK-000-01930	Residence	201 Third Street	1920
BK-000-01931	Residence	205 Third Street	1920
BK-000-01932	Residence	207 Third Street	1920
BK-000-01933	Residence	301 Third Street	1925

SITE NUMBER	SITE TYPE	ADDRESS	ESTIMATED CONSTRUCTION DATE
BK-000-01934	Residence	305 Third Street	1925
BK-000-01935	Residence	103 East Third Street	1920
BK-000-01936	Residence	308 Third Street	1927
BK-000-01937	Residence	107 East Third Street	1923
BK-000-01938	Residence	210 Third Street	1925
BK-000-01939	Residence	208 Third Street	1920
BK-000-01940	Residence	206 Third Street	1915
BK-000-01941	Residence	202 Third Street	1940
BK-000-01942	Residence	110 Third Street	1925
BK-000-01943	Residence (#2)	108 Third Street	1915
BK-000-01944	Residence (#2)	106 Third Street	1938
BK-000-01945	Residence	102 Third Street	N/A
BK-000-01946	Davis, Tammy	104 Third Street	1920
BK-000-01947	Residence (#1)	106 Third Street	1910
BK-000-01948	Residence	West Third Street	1940
BK-000-01949	Telephone Switch Station	Lincoln Avenue	N/A
BK-000-01951	Residence	303 Third	1900
BK-000-01952	Residence	106 West First Street	1920
BK-000-01960	Residence	101 East Third Street	1900
BK-000-01962	Masonic Lodge	300 North Avenue	1915
BK-000-01963	Residence	308 Sherwood	N/A
BK-000-01964	Residence	104 North Avenue	1920
BK-000-01965	Residence	105 North Avenue	ca. 1915
BK-000-01966	Residence	North Avenue	1905
BK-000-01967	Residence	115 North Avenue	1905
BK-000-01968	Residence	110 North Avenue	1941
BK-000-01969	Residence	210 North Avenue	1941
BK-000-01970	Storage	106 East Fourth Street	N/A
BK-000-01971	Residence	108 East Fourth Street	N/A
BK-000-01972	Residence	East Third Street	1915
BK-000-01974	Residence	202 Second Street	1910
BK-000-01975	Mobil Gas Station	107 Hwy 25	1923
BK-000-01976	Residence	102 Hwy 25	N/A
BK-000-01977	Residence	204 Hwy 25	N/A
BK-000-01978	Residence	106 Hwy 25	N/A
BK-000-01979	Residence	202 Hwy 25	N/A
BK-000-01980	Residence (#2)	402 Hwy 25	N/A
BK-000-01981	Residence	300 Hwy 25	N/A
BK-000-01982	Residence (#1)	402 Hwy 25	N/A
BK-000-01983	Residence (#2)	404 Hwy 25	N/A

SITE NUMBER	SITE TYPE	ADDRESS	ESTIMATED CONSTRUCTION DATE
BK-000-01984	Residence (#1)	404 Hwy 25	N/A
BK-000-01985	Residence	104 Second Street	1910
BK-000-01986	Residence	106 Second Street	1910
BK-000-01987	Residence	104 Second Street	1900
BK-000-01988	Residence	206 West Second Street	1915
BK-000-01989	Residence	208 First Street	1910
BK-000-01990	Residence	206 First Street	ca. 1920
BK-000-01991	Residence	204 First Street	1905
BK-000-01992	Abandoned Residence (#2)	200 Third Street	1915
BK-000-01993	Garage	206 North Avenue	1941
BK-000-01994	Residence	202 First Street	1915
BK-000-01995	Residence	108 East First Street	1910
BK-000-01996	Residence	106 East First Street	1916
BK-000-01997	Residence	104 East First Street	1920
BK-000-01998	Residence	102 Second Street	1910
BK-000-01999	Residence	West Third Street	1920
BK-000-02000	Residence	306 Second Street	1921
BK-000-02001	Residence	207 East Second Street	1900
BK-000-02002	Residence	205 East Second Street	1920
BK-000-02003	Residence	201 East Second Street	1921
BK-000-02004	Residence	105 East Second Street	1890
BK-000-02005	Residence	103 East Second Street	1890
BK-000-02006	Residence	305 Second Street	1948
BK-000-02007	Residence	101 Second Street	1921
BK-000-02008	Residence	108 Second Street	1915
BK-000-02009	Residence	303 Second Street	1915
BK-000-02010	Residence	106 Second Street	1905
BK-000-02011	Residence	104 West First Street	1920
BK-000-02012	Residence	110 Second Street	1915
BK-000-02013	Church	112 Second Street	1920
BK-000-02014	Residence	105 West Second Street	1910
BK-000-02015	Residence	103 West Second Street	1921
BK-000-02016	Abandoned School (#1)	200 Third Street	1910
BK-000-02017	Residence	103 Third Street	1905
BK-000-02018	Residence	107 Second Street	1921

Twenty-eight structures are outside the corporate boundaries of White and are noted in the CRGRID databases as buildings, farmsteads (also abandoned), barns, bridges and a windmill constructed between 1889 and 1960 (Table 5 and Figure 4). Two of the 28

structures (BK-000-1601 and BK-000-1613) are within the project area. The remaining 26 structures are within the buffer area.

Table 5
Previously Inventoried Historic Structures outside of the City of White

SITE NUMBER	SITE TYPE	DATE	PROJECT/BUFFER AREA
BK-000-00044	Building	1920	Buffer
BK-000-00045	Building	1910	Buffer
BK-000-00046	Building	Unknown	Buffer
BK-000-00047	Building	1920	Buffer
BK-000-00099	Murfield farm	Unknown	Buffer
BK-000-00100	Hartley homestead	1889	Buffer
BK-000-00192	Abandoned building	Unknown	Buffer
BK-000-00193	Diamond R Ranch	Unknown	Buffer
BK-000-00372	Windmill	Unknown	Buffer
BK-000-00386	Building	Unknown	Buffer
BK-000-00430	Lang Farm	Unknown	Buffer
BK-000-00481	Bridge	1913	Buffer
BK-000-01385	Building	1910	Buffer
BK-000-01386	Abandoned farm	1890	Buffer
BK-000-01391	Building	1920, 1940, 1960	Buffer
BK-000-01401	Building	1954	Buffer
BK-000-01596	Building	1940s	Buffer
BK-000-01599	Barn	Unknown	Buffer
BK-000-01600	Bridge	Unknown	Buffer
BK-000-01601	Building	Unknown	Project
BK-000-01602	Building	Unknown	Buffer
BK-000-01603	Abandoned building	Unknown	Buffer
BK-000-01604	Building	1911	Buffer
BK-000-01605	Bridge	1909	Buffer
BK-000-01606	Building	Unknown	Buffer
BK-000-01607	Bridge	1930s	Buffer
BK-000-01613	Building	Unknown	Project

None of the inventoried structures appear to have been evaluated for eligibility for listing on the NRHP.

10.0 Public Land Survey Map Review

HDR reviewed PLS maps for the project area (Table 6). The maps illustrate environmental conditions including elevation variations across the landscape and

watercourses during the early 1870s. However, the maps indicate no historic-period land use, such as structures, agricultural activities or roads at that time.

Table 6
Public Land Survey Map Data

TOWNSHIP NAME	TOWNSHIP	RANGE	PUBLIC LAND SURVEY DATES	CULTURAL FEATURES/LOCATION
ALTON	110N	48W	1870, 1872	None
AURORA	110N	49W	1870, 1871	None
RICHLAND/LAKE HENDRICKS	111N	47W	1870, 1872	None
SHERMAN	111N	48W	1870, 1872	None
AFTON	111N	49W	1870, 1872	None

11.0 Project Implications for Cultural Resources

After review of the recorded archaeological site information and the information in previous survey reports, HDR believes that the project area has a relatively high potential for prehistoric archaeological resources, particularly on elevated landforms that have escaped cultivation. The previous archaeological surveys, primarily surveys of linear power line corridors and associated features, identified nine prehistoric archaeological resources that illustrate the variety of resources that exist in the project area and vicinity. Six of these archaeological resources are within the project area; the remaining three are within the buffer area. Historic-period archaeological resources are also present, particularly those that may relate to historic American Indian occupations and railroad operations and agricultural activities after the 1870s.

The existing architectural documentation and the results of the HDR windshield survey show that standing structures dating from the 1880s exist in the project area and vicinity. These properties include residential, agricultural, commercial and light industrial structures.

12.0 Conclusions and Recommendations

HDR recommends a Class III cultural resources survey for areas proposed for construction of the wind turbines, associated access roads and staging areas and other elements proposed for development. The PA, prepared by Western and reviewed by consulting parties, will establish the APE for the project. The APE should be surveyed for archaeological and standing structure resources that may be physically impacted by construction of the proposed project. The nature of an archaeological resources survey would depend on surface exposure and the characteristics of the landform. In order to

prepare for the Class III archaeological resources inventory, HDR recommends that, once a proposed site plan reaches a more definitive stage, the plan be communicated to Western cultural resources staff for review in concert with Navitas' project archaeologist. Once the APE for visual effect (to standing structures) has been established, Navitas' architectural historian should document properties over 45 years old within the APE.

Navitas' project archaeologist and architectural historian should design survey methodologies to inventory cultural resources within the APE, document previous disturbance in areas proposed for ground disturbance and provide a preliminary recommendation for NRHP eligibility for each identified resource. This information will be communicated to Western as a Class III inventory report. With concurrence from Western, potentially affected properties will be evaluated for NRHP eligibility and, if determined *Eligible*, resource specific treatment plans will be developed in coordination with Western and the PA signatories. Treatments may include avoidance of eligible archeological sites, impact minimization or mitigation.

13.0 References Cited

Anfinson, S.F.
1997 *Southwestern Minnesota Archaeology, 12,000 Years in the Prairie Lake Region*. Minnesota Historical Society Press, St. Paul, Minnesota.

Brookings County, South Dakota
2005 History of Brookings County. On-line resource located at www.brookingssd.com/history.php

Burns, Patte and James Tudehope
1978 *A Cultural Resource Survey of the Proposed Wastewater Treatment Plant for White, South Dakota – First Survey*. University of South Dakota Archaeology Laboratory.

Frison, G.C.
1978 *Prehistoric Hunters of the High Plains*. Department of Anthropology, University of Wyoming, Laramie, Wyoming.

Gillen, T.V.
1997 *An Intensive Cultural Resources Survey of Sioux Valley Southwestern Electric Company's Proposed 1997 Underground Cable Installation in T111N and T112N, R48W, Brookings County, South Dakota*. Augusta Laboratory, Augustana College, Sioux Falls, South Dakota.

Hanenberger, Ned and James Tudehope
1978 *A Cultural Resource Survey of the Proposed Wastewater Treatment Plant for White, South Dakota – Second Survey*. University of South Dakota Archaeology Laboratory.

Keller, S.
1998 *An Intensive Cultural Resource Survey of a Proposed Bridge Replacement Project in T109N, R47W, Section 6 and T109N, R48W, Section 1, Brookings County, South Dakota Letter Report*. Contract Investigation Series 380.

Lass, B.M.
1980 *Prehistoric Habitation in Northeastern South Dakota: Glimpses from Duel and Hamlin Counties*. Thesis submitted to the faculty of the Graduate School of the University of Minnesota.

Lueck, E. J.
1989 *An Intensive Cultural Resource Survey of Portions of the Proposed Sioux Valley Electric Two-Year Construction Plan in Eastern South Dakota*. Augusta Laboratory, Augustana College, Sioux Palls, South Dakota.

Gillen, T.V., Lueck, E. J. and Winham, P.R.
1994 *An Intensive Cultural Resources Survey of Proposed Sioux Valley Electric Projects in Eastern South Dakota*. Augusta Laboratory, Augustana College, Sioux Falls, South Dakota.

Long, C. and Donohue, J.A.
2000 *A Letter Report on an Intensive Cultural Resource Survey of an Emergency Bridge Replacement Project, BRO 8006(3) PCEMS 032M, Brookings County, South Dakota.*

Newkirk
1982 *Class III Cultural Resource Investigation, Brookings – White 230 kV Transmission Line*. Archaeological Research Center, State of South Dakota.

Sigstad, J. S.
1973 *An Archaeological Survey of the Proposed Watertown, South Dakota – Moville, Iowa 345 kV Transmission Line 1973*. University of South Dakota.

Wood, W.R.
1999 *Archaeology on the Great Plains*. University Press of Kansas.

Zimmerman, L.J.
1985 *Peoples of Prehistoric South Dakota*. University of Nebraska Press.

FIGURES

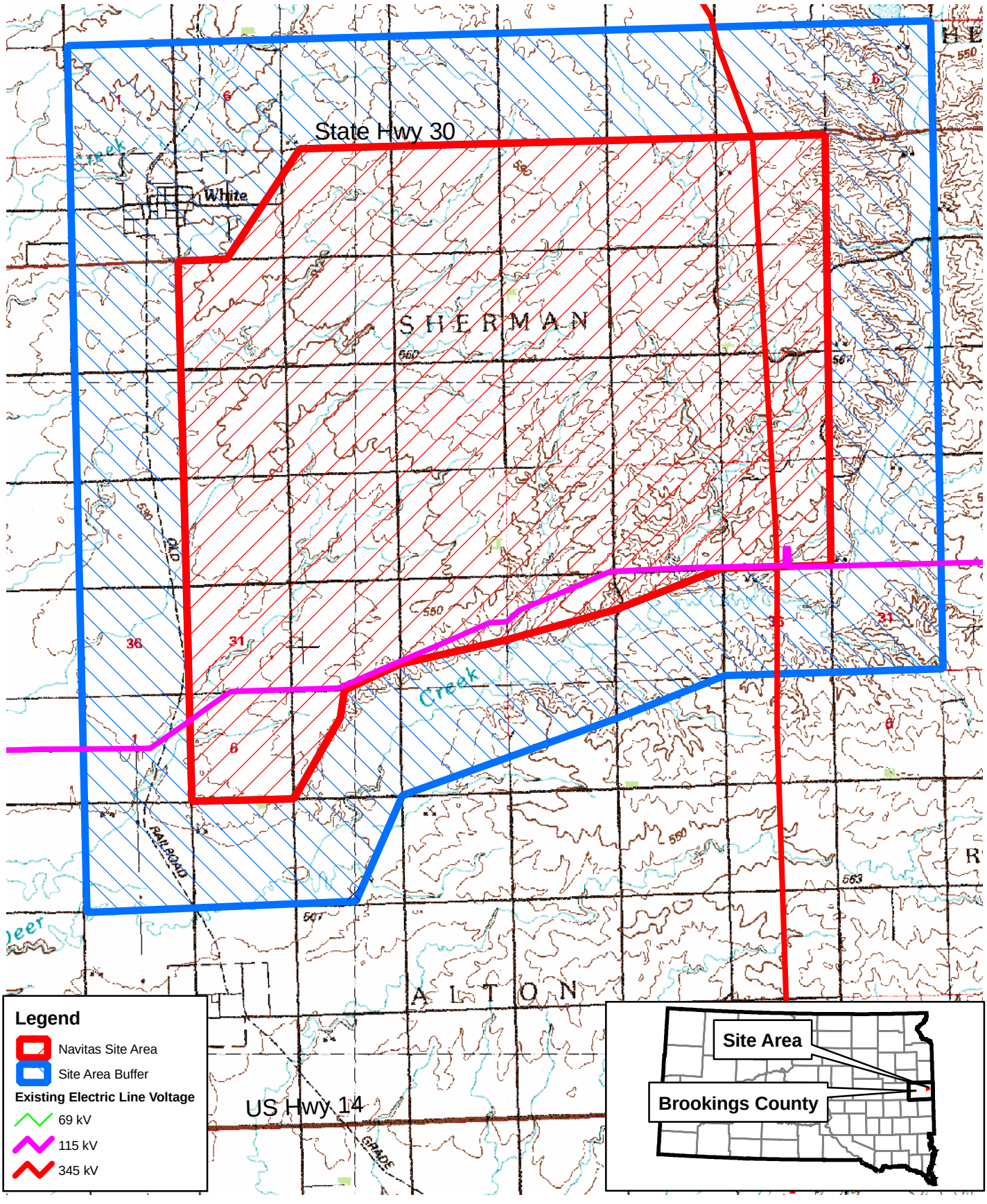

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Figure 1 - Site Location Map
White Wind Farm
Navitas Energy
Brookings County, SD

NAVITAS ENERGY

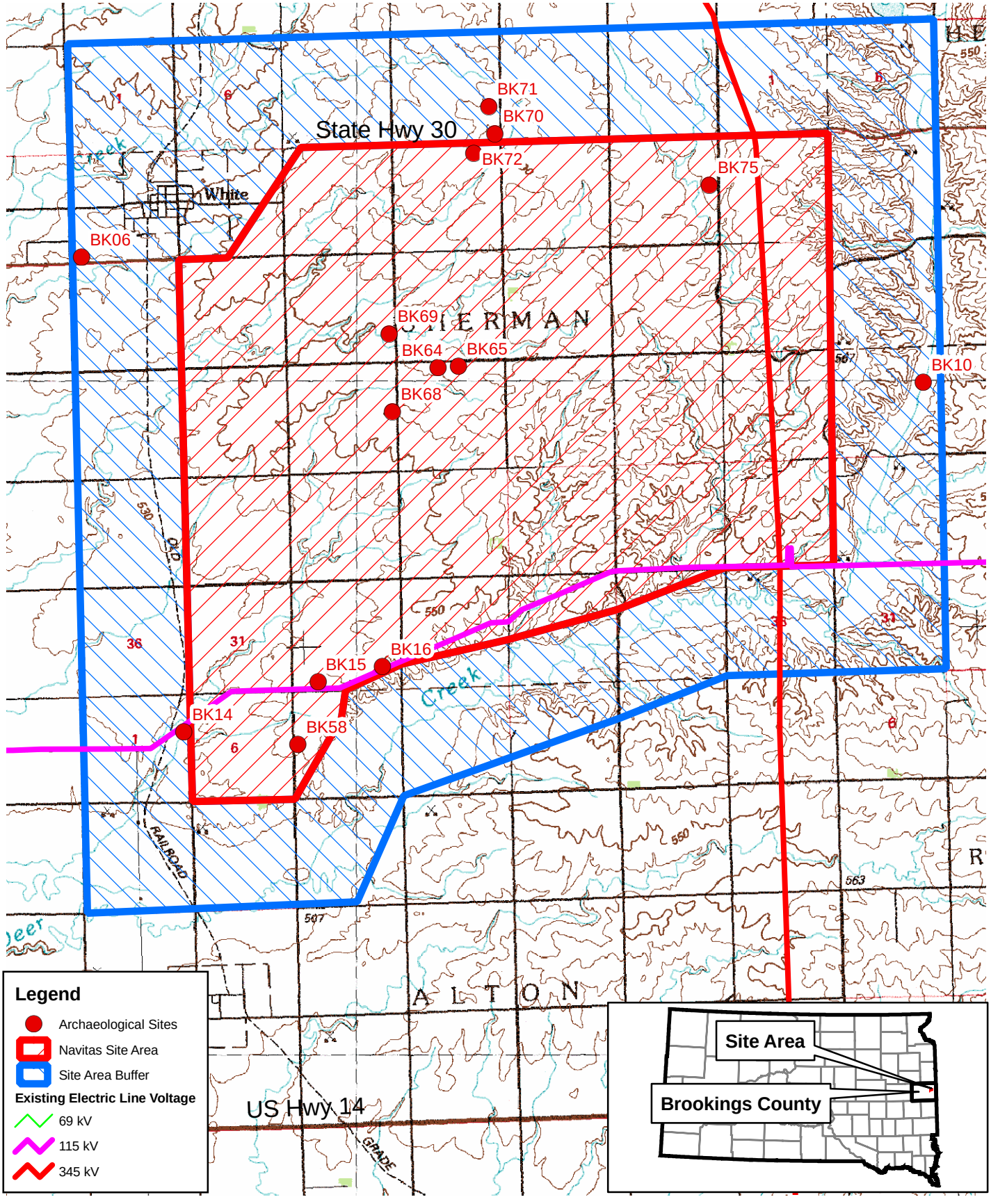

Figure 2 - Archaeological Site Location Map
White Wind Farm
Navitas Energy
Brookings County, SD

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Farmstead at SW ¼ S19, T111N, R48W (Sherman Township)

Abandoned structures at NW ¼ SE ¼ S30, T111N, R48W (Sherman Township)

Figure 3

Sample Standing Structures
Navitas Energy, White Wind Farm
White, South Dakota

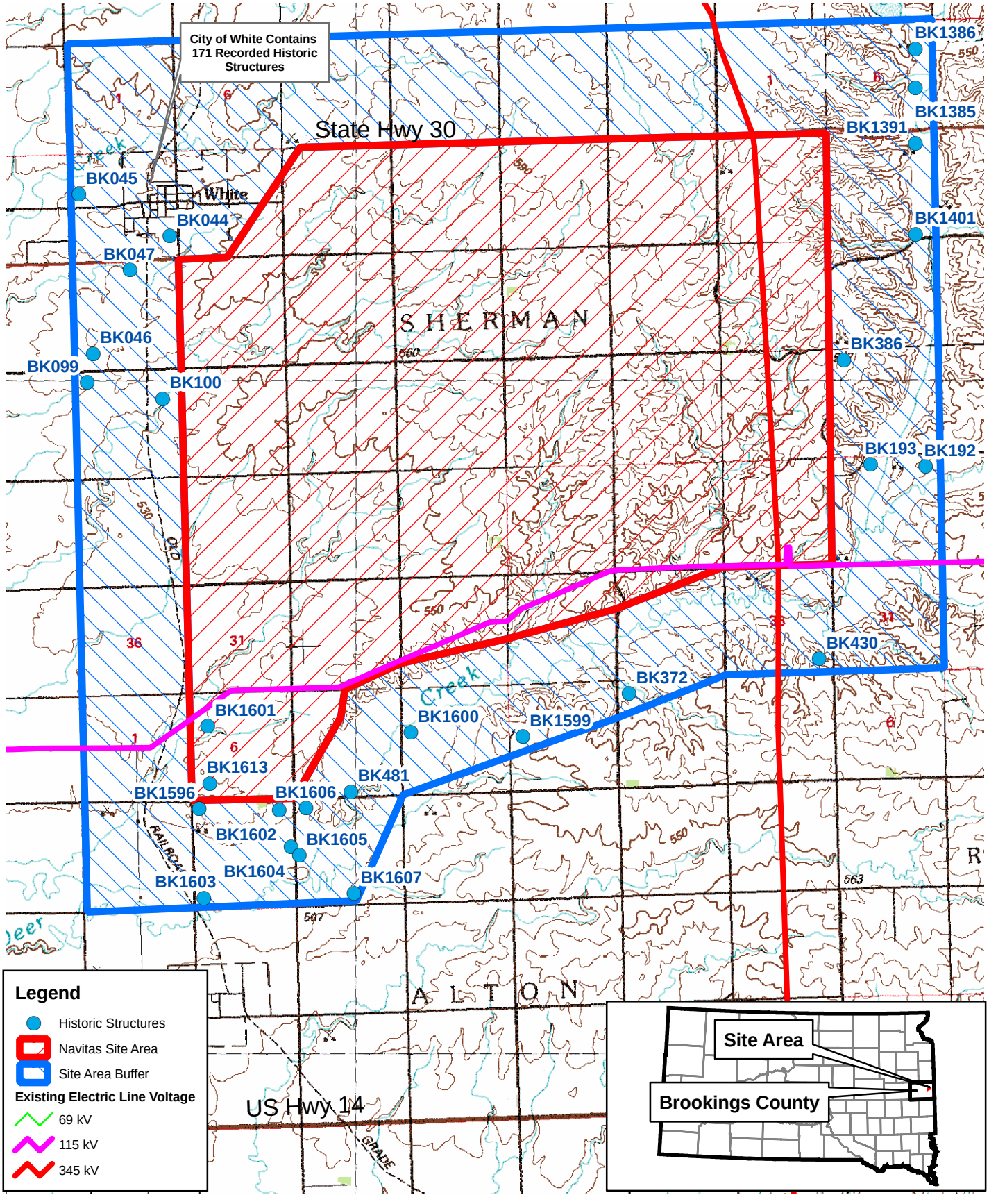

Figure 4 - Historic Structure Location Map
White Wind Farm
Navitas Energy
Brookings County, SD

APPENDIX D
AGENCY LETTERS

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
205 6th St
Brookings, SD 57006
605-692-8003

October 28, 2004

NDR Engineering
6190 Golden Hills Dr.
Minneapolis, MN 55416
Attn: Suzzane Lamb Steinhauer

Dear Ms. Steinhauer:

On behalf of the Brookings Field Office, I appreciate the opportunity to comment on the proposed 200 MW wind farm in Brookings County. I am certain you are aware of the obvious issues concerning birds and bats and trust those concerns will be addressed during the environmental evaluation. The enclosed chart lists Endangered and Threatened Species that occur in Brookings County.

More specifically however, the project may have impacts during the construction phase on the Topeka shiner, an endangered species of minnow that is known to occur in Six Mile Creek north of White and in Deer Creek. NRCS has addressed the impacts of conservation practices on Topeka Shiner habitat and I anticipate that you also will.

I will share any correspondence with the Brookings County Conservation District who, I am sure will show an active interest in the project. The people I have spoken to in regard to expanding wind energy development in Brookings County are generally amiable and welcome the industry to our community.

Sincerely,

Darrell Granbois
District Conservationist

Enclosures: Brookings County Topeka Shiner Map
Table 2. Occurrence of Threatened and Endangered Species – Species List, page 1

Topeka Shiners - Brookings County

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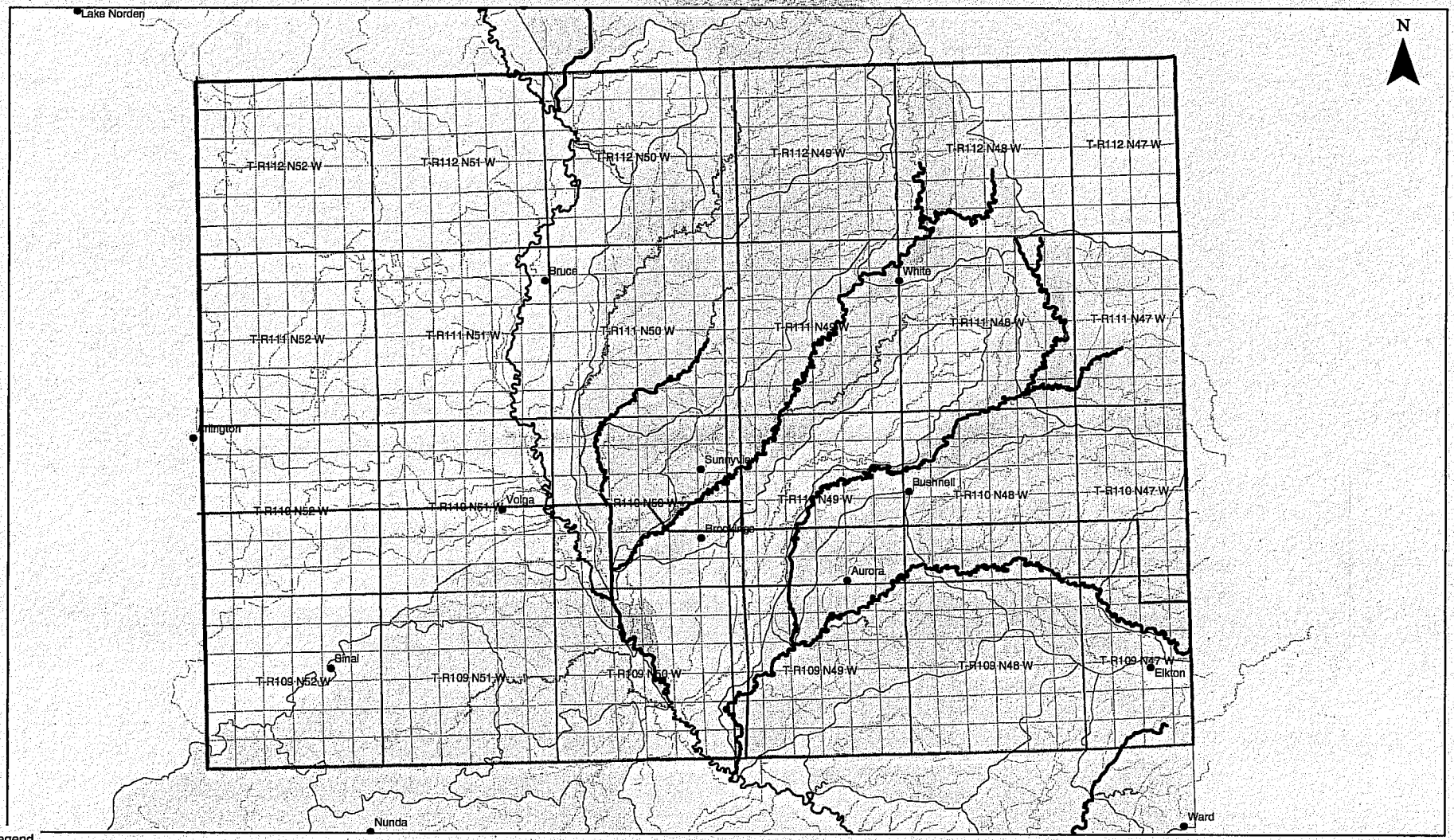
August 26, 2004



Legend

- Zone A: areas of concern
- Watersheds of Zone A and B
- Big Sioux River Watershed
- Streams from 1:100,000 digital data

Priority Zones

- Zone A: High priority stream reaches in occupied watersheds and other known sites
- Zone B
- Zone C: Big Sioux River

SCALE

0 1 2 4 6 8 Miles

Location Map

TABLE 2. OCCURRENCE OF THREATENED AND ENDANGERED SPECIES - LISTED SPECIES [1/ 2/]

COUNTY	BALD EAGLE (FT;ST)	ESKIMO CURLEW (FE, SE) [4/]	LEAST TERN (FE;SE)	PIPING PLOVER (FT;ST)	WHOOPING CRANE (FE;SE) [4/]	PALLID STURGEON (FE;SE)	TOPEKA SHINER (FE)	BLACK-FOOTED FERRET (FE;SE)	SCALESHELL MUSSEL (FE)	AMERICAN BURYING BEETLE (FE)	WESTERN PRAIRIE FRINGED ORCHID (FT)	DAKOTA SKIPPER (C)	AMERICAN DIPPER (ST)	OSPREY (ST) [4/]	PEREGRINE FALCON (SE) [4/]	BLACK BEAR (ST)	RIVER OTTER (ST)	SWIFT FOX (ST)	BANDED KILLFISH (SE)	BLACKNOSE SHINER (SE)	CENTRAL MUDMINNOW (SE)	FINESCALE DACE (SE)	LONGNOSE SUCKER (ST)	NORTHERN REDBELLY DACE (ST)	PEARL DACE (ST)	SICKLEFIN CHUB (ST)	STURGEON CHUB (ST)	TROUT/PERCH (ST)	EASTERN HOGNOSE SNAKE (ST)	LINED SNAKE (ST)	BLANDING'S TURTLE (SE)	FALSE MAP TURTLE (ST)
Aurora	k				k		k							m	m																		
Beadle	k				k		k							m	m																		
Bennett	kn				k						p			m	m			k						k	k		k					
Bon Homme	kn		k	k*		k								m	m												h						k
Brookings	k						k			p	p	k		m	m						k			k				k					
Brown	kn	er					k				p	k		m	m																		
Brule	k			p	k	k								m	m													h					k
Buffalo	k			p	k	k								m	m		p																k
Butte	k				k									m	m			p					k										
Campbell	k		k	k*	k	p								m	m																		
Charles Mix	k		k	k*	k	k								m	m			p	k								h	h					k
Clark	k				k		k							m	m																		
Clay	k		k	k*		p	k		h		p			k	m												h	h		k	k		k
Codington	k				k		p				p	k		m	m														k				
Corson	k		k	k*	k	p	h							m	m			p									h	h					k
Custer	kn													k	m	p	k	p										k					
Davison	k						k							m	m																		
Day	k			k							p	k		m	m				k		k												
Deuel	k						k				p	k		m	m				k		k			k									
Dewey	k		k	k*	k	k	h	p						m	m			p										p					
Douglas	k				k									m	m																		
Edmunds	k				k							k		m	m																		
Fall River	kn													m	m			k				k						k					
Faulk	k				k									m	m																		
Grant	kn						p				p	k		m	m						k			k				k					
Gregory	kn		k	k*	k	k		p		k				m	m										k	h	h						k
Haakon	k		k	k	k					p				m	m		p	p									k						
Hamlin	k						k					k		m	m														k				
Hand	k				k									m	m																		
Hanson	k						k							m	m																		
Harding	k													m	m			p										h					

1/ Key: k - Known; kn - Known, nest: m - Migrant; h - Historical; p - Potential; er - Extremely Rare; * - designated critical habitat

2/ Gray wolves are rare transients in the state

3/ Key to listing status: FE-Federally Endangered; FT-Federally Threatened; SE-State Endangered; ST-State Threatened; PE-Proposed Endangered; PT-Proposed Threatened; C-Candidate

4/ Statewide Migrant

Bob Sahr, Chair
Gary Hanson, Vice-Chair
Jim Burg, Commissioner

SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

500 East Capitol Avenue
Pierre, South Dakota 57501-5070
www.state.sd.us/puc

Capitol Office
(605) 773-3201
(605) 773-3809 fax

Transportation/Warehouse
(605) 773-5280
(605) 773-3225 fax

Consumer Hotline
1-800-332-1782

November 1, 2004

Suzanne Lamb Steinhauer
HDR Engineering Inc
6190 Golden Hills Drive
Minneapolis MN 55416

Dear Ms. Steinhauer:

The Public Utilities Commission has received your letter regarding the construction of a 200 MW Wind Farm proposed by Navitas Energy in Brookings County, South Dakota. South Dakota Codified Law (SDCL) 49-41B-2(4) states that an energy conversion facility is any new facility, or facility expansion, designed for or capable of generation of 100 MW or more of electricity. Based on the information provided in your letter, the proposed project meets this definition. SDCL 49-41B-4 states no utility may begin construction of a facility in the state on or after July 1, 1979 without first having obtained a permit issued with respect to such facility by the Public Utilities Commission pursuant to SDCL 49-41B. Dependant on the size and route the associated transmission facility may also be required to be permitted in accordance with SDCL 49-41B.

In addition to the permits issued by the Public Utilities Commission, there may be additional permit requirements from other state agencies. Contact Kent Woodmansey of the Department of Environment and Natural Resources (605 773-3351) for additional permitting requirements.

Should you have any questions or need additional assistance please call me at (605) 773-6335.

Sincerely,

Michele M. Farris, P.E.
Utility Analyst

cy: Karen Cremer, Staff Attorney

DEPARTMENT OF GAME, FISH AND PARKS
Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182

November 2, 2004

Suzanne Lamb Steinhauer
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

Suzanne:

As requested, I have searched the South Dakota Natural Heritage Database for records of rare, threatened or endangered species in the project area described in your letter of October 25. There are three records of state or federally listed fish species in that area. The records are listed below.

Species	Location	Township Range	Section	Last Observed	Federal Status	State Status
Northern Redbelly Dace	Deer Creek	111N 48W	17	1952		Threatened
Topeka Shiner	Deer Creek	111N 48W	13 NW4	2000	Endangered	
Topeka Shiner	Six-mile Creek	111N 48W	6 SW4	2000	Endangered	

In addition to these species, there are other federally listed species that potentially could occur in this area. New bald eagle nests are being found every year in South Dakota and there is good habitat for nesting bald eagles in this area. There could be existing bald eagle nests that have not been discovered within the project area. Bald eagles are listed as federally threatened.

Nearly the entire population of whooping cranes (<200) migrates through South Dakota every spring and fall. While most of the whooping cranes migrate through the central and western areas of South Dakota, occasionally they do occur in eastern South Dakota. Whooping cranes are a federal endangered species.

We have very little information the movements of migratory bats or birds in the project area. Bats in particular appear to be vulnerable to wind generators. It is likely that populations of bats use various habitats in the project area, especially woodland and forest habitat. Although we have no records of bat species in the project area, the lack of records does not indicate that bats are absent.

If you have any questions or need additional information, please contact me. My phone is (605) 773-4345.

Sincerely,

Doug Backlund
Wildlife Biologist

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
SOUTH DAKOTA REGULATORY OFFICE
28563 POWERHOUSE ROAD, ROOM 118
PIERRE, SD 57501-6174

REPLY TO
ATTENTION OF

November 8, 2004

South Dakota Regulatory Office
28563 Powerhouse Road, Room 118
Pierre, South Dakota 57501

HDR Engineering, Inc.
Attn. Suzanne Lamb Steinhauer
6190 Golden Hills Drive
Minneapolis, Minnesota 55416

Dear Ms. Steinhauer:

Reference is made to a preliminary information received in this office on November 2, 2004, concerning Department of the Army authorization requirements for the construction of a 200 MW wind farm located in Brookings County, South Dakota.

The Corps' jurisdiction is derived from Section 404 of the Clean Water Act passed by Congress in 1972. Section 404 calls for Federal regulation of the discharge of dredged or fill material into certain waterways, lakes and/or wetlands (i.e. waters of the United States).

Based on the preliminary information provided, it can not be determined if the proposed construction activities involves the discharge of dredged or fill material in jurisdictional waterways. Therefore, a Department of the Army permit may be required. For our final determination and for processing of permits, we would ask that you submit final plans when they become available.

Enclosed is the necessary application form (ENG Form 4345) and information pamphlet. When completing the application form, we would request from the applicant (a) a detailed description of the work activity [i.e., explain precisely what you are going to do and how you are going to accomplish it; include fill and/or excavation quantities and dimensions to be performed below the ordinary high water elevation (if in a lake, river, or stream) or to be performed within the boundary of jurisdictional wetlands (if the project involves wetlands), along with the source/type of fill and the type of equipment to be used during construction]; (b) the purpose, need, and/or benefits of the proposed project; and (c) any alternative project designs or locations considered.

Along with the completed application form, we would request from the applicant (1) detailed drawings (plan and cross-sectional views; the drawings may be submitted on 8-1/2x11 inch paper), (2) a location map showing the project site, (3) a delineation of affected wetlands if the project involves wetlands, (4) if available, colored pictures showing at least two views of the proposed project site and (5) any ecological or environmental information available that you feel may be pertinent to your project (i.e., area wildlife activity, area vegetation, area land use, quality of fishery, etc.).

Adherence to the above information requests will speed up the application evaluation and permit processing time. The requested information is used to help the Corps determine the type of permit to process if a permit is required and is used in the public review.

If we do not hear from you within sixty (60) days from the date of this letter, we will assume that you have decided not to complete your proposed project and that this proposal requires no further action. You may however, at any time in the future, submit an application for this project or any other proposal to conduct work in waters of the United States.

You can obtain additional information about the Regulatory Program and download forms from our website: www.nwo.usace.army.mil/html/od-rsd/frame.html

If you have any questions or need any assistance, please feel free to contact this office at the above Regulatory Office address or telephone Carolyn Kutz at (605) 224-8531 and reference action ID 200430383.

Sincerely,

Steven E. Naylor
Regulatory Program Manager,
South Dakota

Enclosures

BROOKINGS COUNTY ZONING DIRECTOR
BROOKINGS COUNTY RESOURCE CENTER
826 32nd AVE
BROOKINGS, SOUTH DAKOTA 57006

ROBERT W. HILL
TELEPHONE (605) 696-8350
FAX (605) 696-8355
E-MAIL zoning@brookings.net

November 15th, 2004

HDR Engineering, Inc.
Attn: Suzanne Lamb Steinhauer
6190 Golden Hills Drive
Minneapolis, MN 55416

Dear Suzanne:

This letter is to inform you that my office has received your request for input pertaining to the possible development of a Wind Farm in Brookings County, SD.

Brookings County is currently in the process of changing our Zoning Ordinance to conform to setback requirements of the newest wind energy systems. I will be able to send you a copy of the changed ordinance after the final public hearings.

I have enclosed the necessary Highway Department forms needed to build access points across county and state right-of-ways. These forms are required even if the access is considered temporary.

Brookings County will submit more feedback as the project progresses and public notices are published.

The Brookings County Highway Department can be contacted at 605-696-8270 and the Zoning Office at 605-696-8350.

Sincerely,

Robert W. Hill
Brookings County
Zoning and Drainage Director

Application for Highway Access Permit
South Dakota Department of Transportation

Permit Application (to be completed by applicant).

Instructions: Please contact the local South Dakota Department of Transportation office to determine what supporting documents must accompany this application. Please submit a separate application and supporting documentation for each access requested. Attach additional sheets as necessary. Please print or type.

Property Owner:	**Applicant (if different from Owner):**
Name(s):	Name(s):
Mailing Address:	Mailing Address:
City, State, Zip	City, State, Zip
Daytime Phone:	Daytime Phone:

Property to be Served by Approach:	**State Highway to be Accessed by Approach:**
County: Section: Township: Range: **Or** Subdivision: Block/Lot: Street Address: City:	State Highway Number: Access would be _____ feet (north, south, east or west) from _____ (nearest cross street).

Land Use of Property to be Served (check one):	**Type of Permit Requested (check one)**
☐ Agricultural: acres served _____ ☐ Business: type _____ total square footage of buildings:____ number of employees _____ ☐ Residential: number of single-family dwellings _____, or number of multi-family dwellings _____. ☐ Other: describe _____	☐ New approach ☐ Change in use ☐ Temporary access ☐ Improve existing access ☐ Relocate existing access ☐ Remove existing access

Local Government Reviews:

County:	**Municipality:**
Comments: Concurrence signature: Date:	Comments: Concurrence signature: Date:

Estimated Date of Construction:

I, the undersigned, request permission to construct or modify an access approach subject to the rules and regulations set forth in SDCL 70:09.

Signature of Applicant: **Date:**___/___/___

Permit Decision (to be completed by SDDOT).

Supporting Materials Required: (Required)		(Received)
☐	Access Approach Design	☐
☐	Vicinity Map	☐
☐	Traffic Volumes	☐
☐	Three Copies of Site Plan	☐
☐	Traffic Control Plan	☐
☐	Proof of Liability Insurance	☐
☐	Detailed Development Plan	☐
☐	Drainage Plan	☐
☐	Traffic Impact Study	☐
☐	Revegetation Plan	☐
☐	Other _____	☐

Received by SDDOT: **Date:**___/___/___

Decision: (to be made after Application Review)

☐ Access Approved
☐ Access Approved with Variance: _____

_____

☐ Access Denied

Terms and Conditions of Approval (or Reason for Denial)

Permit Expiration Date: ___/___/___

SDDOT Area Engineer Signature:	**SDDOT Area:**
Date: ___/___/___	**Area Office** _____ **Contact Person** _____ **Contact Phone** _____ **Permit Number** _____

Distribution: Original – Owner; Copies – Access Management, Area Office, Region Office v.8/2002

State Highway Access Approach Permit
Standard Conditions

When this permit was issued, the Department made its decision based in part on information submitted by the applicant, what alternative access to other public roads and streets was available, the operation of the highway and safety and design standards. Changes in access approach use or design not approved by the Department may cause the revocation or suspension of the permit. The permittee is responsible for the costs of construction, maintenance, and removal (if necessary) of the approach.

PERMIT EXPIRATION

A permit shall be considered expired if the access is not under construction within one year of the permit issue date or before the expiration of any authorized extension. When the permittee is unable to commence construction within one year after the permit issue date, the permittee may request a one-year extension from the Department. Only one extension may be granted. Any request for an extension must be in writing and submitted to the Department before the permit expires. The request should state the reasons why the extension is necessary, when construction is anticipated, and include a copy of page 1 (face of permit) of the access permit. Extension approvals shall be in writing. Any person wishing to reestablish an access permit that has expired may begin again with the application procedures.

CONSTRUCTION

1. The construction of the access and its appurtenances as required by the terms and conditions of the permit shall be completed at the expense of the permittee. All materials used in the construction of the access within the highway right-of-way or on permanent easements, become public property. Any materials removed from the highway right-of-way will be disposed of only as directed by the Department. Only clean fill material may be used for construction. Rubble and organic materials are prohibited. Permittee is responsible for salvaging and replacing topsoil, erosion control and revegetation of access.
2. The permittee shall notify the Area Office at least two working days prior to any construction within state highway right-of-way. Construction of the access shall not proceed until the access permit is issued. The access shall be completed in an expeditious and safe manner and shall be finished within 45 days from the initiation of construction within the highway right-of-way. One construction time extension may be requested from the Area Engineer. The permittee shall also notify the Area Office two days prior to substantial completion of the access construction.
3. A utility permit shall be obtained for any utility work within highway right-of-way. Where necessary to remove, relocate, or repair any traffic control device or public or private utility for the construction of a permitted access, the relocation, removal or repair shall be accomplished by the permittee without cost to the Department, and at the direction of the Department or utility company. Any damage to the state highway or other public right-of-way beyond that which is allowed in the permit shall be repaired immediately. The permittee is responsible for the repair of any utility damaged in the course of access construction, reconstruction or repair. Utilities are responsible for salvaging and replacing topsoil and must have an approved erosion control and revegetation plan. A final inspection must be held with the utility at the completion of the work.
4. The Department and the local government may inspect the access during construction and upon completion of the access to determine that all terms and conditions of the permit are met. Inspectors are authorized to enforce the conditions of the permit during construction and to halt any activities within state right-of-way that do not comply with the provisions of the permit, that conflict with concurrent highway construction or maintenance work, that endanger highway property, natural or cultural resources protected by law, or the health and safety of workers or the public.
5. Prior to using the access, the permittee is required to complete the construction according to the terms and conditions of the permit. Failure by the permittee to abide by all permit terms and conditions shall be sufficient cause for the Department to initiate action to suspend or revoke the permit and close the access. If in the determination of the Department the failure to comply with or complete the construction requirements of the permit create a highway safety hazard, such shall be sufficient cause for the summary suspension of the permit. If the permittee wishes to use the access prior to completion, arrangements must be approved by the Department and included in the permit. The Department may order a halt to any unauthorized use of the access pursuant to statutory and regulatory powers. Reconstruction or improvement of the access may be required when the permittee has failed to meet required specifications of design or materials.
6. The permittee shall provide construction traffic control devices at all times during access construction, in conformance with the Manual on Uniform Traffic Control Devices as required by state statute.

INSTRUCTIONS
Applying for permission for driveway or intersection on a South Dakota state highway

1) Contact the South Dakota Department of Transportation as soon as possible. Personnel at the locations listed below can help you plan your approach in compliance with South Dakota laws and regulations.

SDDOT Area Offices

Aberdeen Area Office
Phil Dwight
PO Box 1767
Aberdeen, SD 57401-1767
605-626-7885

Watertown Area Office
Ron Sherman
PO Box 1446
Watertown, SD 57201-1446
605-882-5166

Sioux Falls Area Office
Craig Smith
PO Box L
Sioux Falls, SD 57101-1927
605-367-5680

Mobridge Area Office
John Villbrandt
PO Box 488
Mobridge, SD 57601-0488
605-845-3844

Belle Fourche Area Office
Lyle Haak
PO Box 786
Belle Fourche, SD 57717-0786
605-892-2872

Rapid City Area Office
Gary Engel
PO Box 1970
Rapid City, SD 57709-1970
605-394-2248

Huron Area Office
Wayne Cramer
PO Box 940
Huron, SD 57350-0940
605-353-7140

Mitchell Area Office
Ron Gillen
PO Box 1206
Mitchell, SD 57301-7206
605-995-8120

Yankton Area Office
Ron Peterson
1306 W. 31st St.
Yankton, SD 57078-9662
605-668-2929

Pierre Area Office
Norm Konechne
104 S. Garfield
Pierre, SD 57501-5405
605-773-5294

Winner Area Office
Doug Sherman
PO Box 771
Winner, SD 57580-0771
605-842-0810

Custer Area Office
Don Kraus
PO Box 431
Custer, SD 57730-0431
605-673-4948

BROOKINGS COUNTY DRIVEWAY APPLICATION AND CONSTRUCTION PERMIT

Application made by _____
(Type or Print full name)

for an entrance to be located off Brookings County Highway No. _____
(County Road No.)

Pertinent information to the proposed entrance:

1. Type of entrance:
   - A. Commerical _____
   - B. Residential _____
   - C. Farm _____
   - D. Other _____
2. Location:
   - A. Township _____
   - B. Section _____
   - C. Co. Rd. No. _____
   - D. Approximate Location _____
     _____
   - E. Legal Description _____
     _____
3. Entrance:
   - A. Width (driveway top) _____
   - B. Approximate date of construction _____

ENTRANCE TO BE BUILT AS DIRECTED BY THE BROOKINGS COUNTY HIGHWAY DEPARTMENT

Submitted by:

_____
Name

_____ _____
Address Phone No.

_____
City State Zip Code

Below Filled Out by Brookings County

On Site Survey by: _____
(Type or Print Name)

Culvert Needed: Yes _____ No _____ Type _____ Size _____
(cmp/rcp) (Length & Height)

Approved by : _____ Date: _____
Brookings Co. Highway Superintendent

Brookings Co. Highway Superintendent

CONTRACTORS NAME:

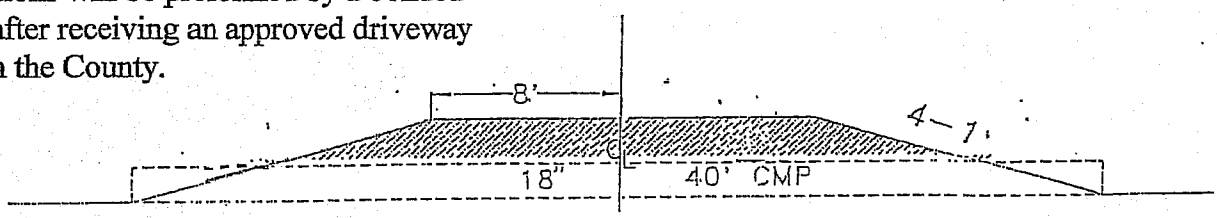
Name

Address

City State Zip

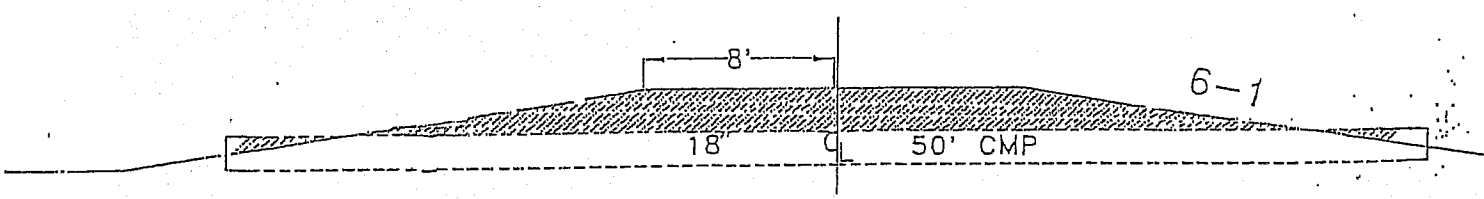
(Area Code) Phone

NOTE:
Pipe size and length will be determined by the Brkgs. Co. Highway Dept. in relation to the location of the proposed driveway entrance. All installations will be preformed by a bonded contractor after receiving an approved driveway permit from the County.



TYPICAL SECTION FOR A 16' DRIVEWAY
WITH 4-1 SIDESLOPES
WITH A STANDARD 3-1/2' DITCH

NOTE:
The work will be done in accordance with the S.D. Dept. of Transportation STANDARD SPECIFICATIONS for ROADS and BRIDGES.



TYPICAL SECTION FOR A 16' DRIVEWAY
WITH 6-1 SIDESLOPES
WITH A STANDARD 3-1/2' DITCH

BROOKINGS COUNTY HIGHWAY
HIGHWAY USE PERMIT

☐ Annual Permit ☐ Single Trip

PERMIT EFFECTIVE FROM _____ TO _____

•••••••••••••••• ISSUED SUBJECT TO ALL APPLICABLE LAWS AND REGULATIONS ••••••••••••••••

DATE _____ TIME _____ CASH ☐ CHECK ☐ # _____ OTHER ☐ _____

CARRIER _____ RECEIVED OF _____

ADDRESS _____ SEND PERMIT TO _____

ORIGIN _____ DESTINATION _____ ADDRESS _____

ROUTES TRAVELED _____

CARGO _____

TRUCK _____ STATE _____ LICENSE # _____ SERIAL # _____

TRAILER #1 _____ STATE _____ LICENSE # _____ SERIAL # _____

TRAILER #2 _____ STATE _____ LICENSE # _____ SERIAL # _____

GENERAL PERMIT INFORMATION _____

_____

_____

_____

_____

☐ TRIP PERMIT _____ $ _____

~~☐ TEMPORARY FUEL PERMIT~~ _____ _____

☐ OVERSIZE PERMIT: WIDTH _____ LENGTH _____ HEIGHT _____ _____

~~☐ OVERWEIGHT PERMIT- GROSS WEIGHT _____ # OF AXLES _____~~ _____

~~☐ SPECIAL PERMIT~~ _____ _____

CO. HIGHWAY RECEIPT NUMBER _____ CO. TREASURE RECEIPT NUMBER _____

ISSUED BY _____

COMPANY REPRESENTATIVE _____

TITLE _____

NO OVERWIDTH MOVEMENT SUNSET TO SUNRISE.
A COPY OF THIS PERMIT MUST BE CARRIED IN EACH PERMITTED VEHICLE AND MUST BE DISPLAYED UPON DEMAND OF ANY LAW ENFORCEMENT OFFICER OR HIGHWAY SUPERINTENDENT.

VEHICLE PHYSICALLY INSPECTED. YES ☐ NO ☐

APPLICATION FOR OCCUPANCY
ON
THE RIGHT-OF-WAY OF COUNTY HIGHWAYS

To: The Board of County Commissioners

_____ County

_____South Dakota

Application is made by_____

for _____ occupancy of Highway

Number_____, in Section_____, Township_____,

Range _____, _____ County, South Dakota.

Project No._____

A sketch showing the location must be attached.

The following information is pertinent to the proposed installation:

1. Intended usage_____

2. Cable Type_____

3. Outside Diameter or Pipe Size_____

4. Method of Installation_____

5. Crossing Bituminous Roads_____

This installation will comply with the National Safety Code and all Federal Guidelines.

Warning signs will be installed where appropriate.

Ditches will be restored back to present condition.

Owner will move its buried cable or pipe, in case of road construction, at no cost to the County.

Prior to any road construction or maintenance within the County, the owner shall call South Dakota One-Call at 1-800-781-7474 for location of the facilities.

Submitted:_____

Company:_____

By Authority:

By:_____

Recommended for Approval:

By:_____
County Highway Superintendent

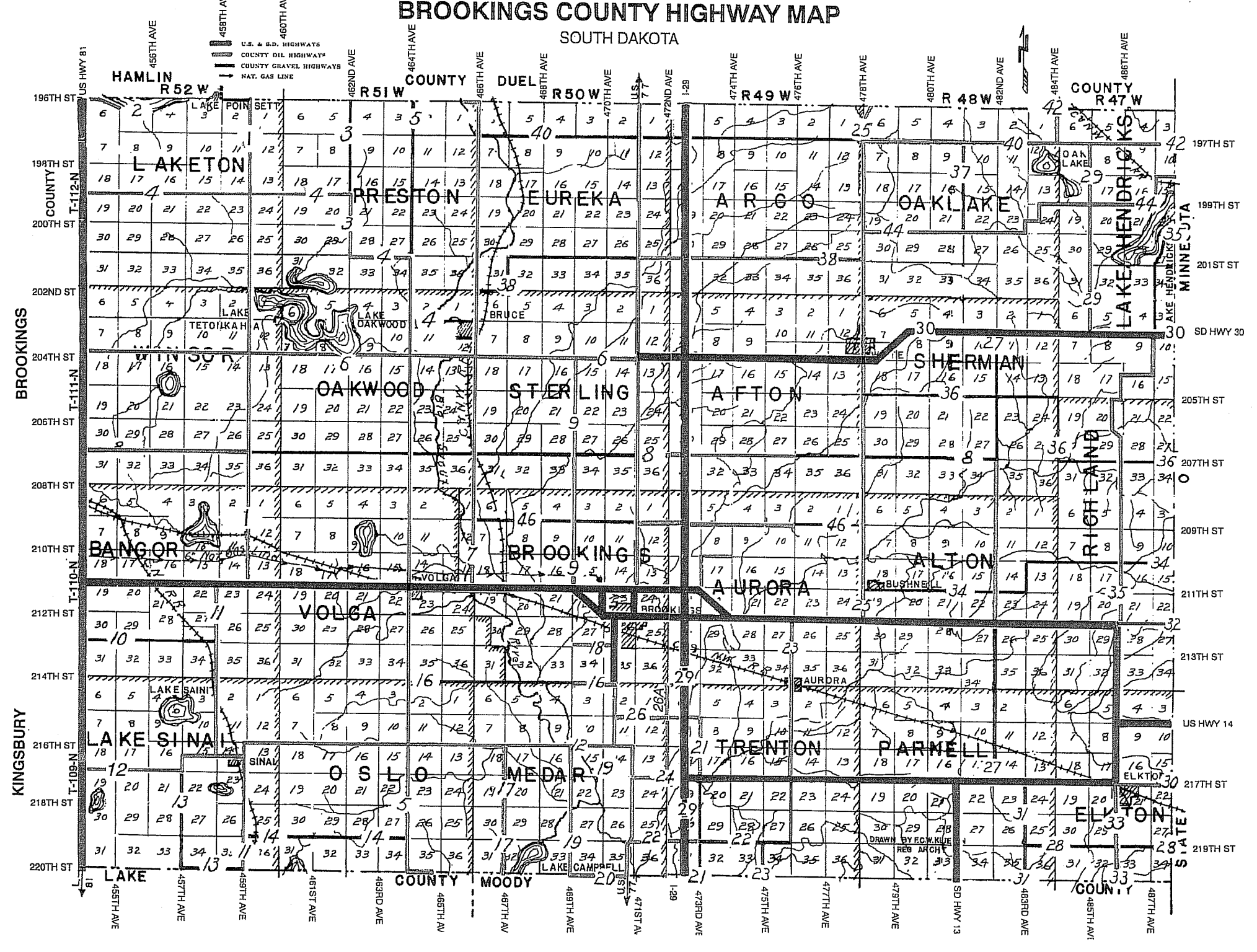
Approved: Board of County Commissioners

By:_____

Date:_____

BROOKINGS COUNTY HIGHWAY MAP

SOUTH DAKOTA



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

November 19, 2004

Suzanne Lamb Steinhauer, Environmental Planner
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, Minnesota 55416

Re: White 200 MW Wind Farm in
Brookings County, South Dakota

Dear Ms. Steinhauer:

This letter is in response to your request dated October 25, 2004, for environmental comments regarding the above referenced project involving the construction of a 200-megawatt wind farm by Navitas Energy in Brookings County near White, South Dakota. Your letter states that the interconnection of this proposed turbine site with the Western Area Power Administration's (WAPA) power system near White is the Federal nexus that instigated consultation with our office as per section 7 of the Endangered Species Act, as amended, 16 USC 1531 et seq. A 57-square mile area is the current proposed project area: Sections 6, 7, 18, 19, 30, and 31, Township 111 North, Range 47 West; all of Township 111 North, Range 48 West; Sections 1, 12, 13, 24, 25, and 36, Township 111 North, Range 49 West; Sections 2-8, Township 110 North, Range 48 West; and Sections 1 and 12, Township 110 North, Range 49 West.

The U.S. Fish and Wildlife Service (Service) responded to a previous wind farm proposal (for PPM Energy) in the vicinity of this project submitted by Ms. Michelle Bissonnette of HDR Engineering in July of 2003. Some of the area encompassed by that project proposal overlaps with the current proposal for Navitas Energy. The majority of the comments within that letter apply to the current project and are reiterated herein. Since the PPM Energy project has already been proposed (and perhaps already constructed - our office has not been kept informed of its status), consideration of cumulative effects of wind turbines as a result of this project is appropriate.

The Service's primary concerns regarding wind turbines are collision mortality of birds 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, their use by various species of wildlife, landscape features, prey base, migration corridors, and behavioral patterns. Currently, perhaps the best means of avoiding impacts to wildlife is to avoid high wildlife use areas.

The PPM Energy proposed project area was determined, upon a site visit by Natalie Gates of this office and per conversations with Ms. Bissonnette of HDR Engineering, to be considerably impacted by agriculture, with some grazed property interspersed. Since the current proposed project area is situated immediately to the west of the that site, with some overlap, we surmise the current proposed project area incurs similar land use. Raptors were observed onsite during that visit, and the area topography suggests that it could receive high use by raptors which seem to be particularly vulnerable to wind turbine related mortality. Raptor counts during spring/fall migration prior to construction may be valuable. Additionally, recent studies of grassland nesting birds have shown a tendency for avoidance of areas immediately surrounding turbines. Placement of the turbines within cropland would minimize that concern. We recommend that wildlife use of the area be further evaluated prior to construction and appropriate project modifications made, as necessary, to minimize wildlife impacts. Post construction monitoring is also recommended in order to further understand impacts from wind turbines. Bat collision mortality is often an issue at wind turbine farms. The South Dakota Department of Game, Fish and Parks (SDDGFP) has developed a bat management plan for the State and has been involved with bat/turbine issues at other wind projects in South Dakota. If you have not already done so, we recommend that you contact Ms. Alyssa Kiesow of the SDDGFP at (605) 773-2742 regarding this topic.

As you may be aware, the Service has developed voluntary interim guidelines to assist energy companies in accomplishing the goal of reducing the risk posed by turbines to wildlife. You may access these guidelines on the internet at: http://www.fws.gov/r9dhcbfa/wind.pdf. The guidelines stress the importance of proper evaluation of potential wind turbine development sites, proper location and design of turbines and related facilities, and pre- and post-construction research and monitoring.

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. We recommend that you contact Ms. Jill Shaffer of the Northern Prairie Wildlife Research Center at (701) 253-5547 for more information. Perhaps Navitas Energy would be interested in participating in this research effort.

Some of the information in the Service's wind turbine guidance is similar to our guidelines concerning communication towers. It is our understanding that meteorological towers are often constructed in association with wind turbines and that these structures are often similar in design to typical communication towers: tall, lighted, lattice structured, and guyed. These types of towers can be problematic primarily for avian wildlife as the birds may be drawn to the towers, particularly during inclement weather, and reluctant to leave the lighted area. Mortality results as the birds circle the structure and collide with the guy wires or the lattice of the tower itself. If meteorological towers will be part of the proposed project, we recommend following the guidance set forth in "U.S. Fish and Wildlife Service Interim Guidelines for Recommendations on Communications Tower Siting, Constructions, Operation and Decommissioning" (http://migratorybirds.fws.gov/issues/towers/comtow.html) to minimize the threat of avian mortality.

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. Enclosed you will find a Tower Site

Evaluation Form. If towers other than the turbines themselves are to be constructed, please complete this form and return it to our office.

Although the Service's communication tower 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 Migratory Bird Treaty Act of 1918 (MBTA), as amended, 16 U.S.C. 703 et seq., and the Bald Eagle Protection Act of 1940 (BEPA), 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 BEPA 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.

In accordance with section 7(c) of the Endangered Species Act, 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
Bald eagle (Haliaeetus leucocephalus)	Threatened	Migration, Wintering, Possible Nesting.
Topeka shiner (Notropis topeka)	Endangered	Known Resident.
Western prairie fringed orchid (Platanthera praeclara)	Threatened	Possible Habitat, No Recent Specimens.

Bald eagles could potentially be observed in Brookings County (and throughout the state of South Dakota) any time of the year, including the breeding season. We are currently unaware of any bald eagle nests within Brookings County; however, new nests appear each year. The species' nesting season is January to August. Any nests found within one mile of the project area should be reported to this office.

Topeka shiners are known to occupy numerous small streams within eastern South Dakota, and most are concentrated within the Big Sioux, Vermillion, and James River watersheds. Survey efforts continue to reveal additional inhabited streams. Deer Creek is a known Topeka shiner occupied stream that extends into the proposed project area. Although we recognize that wind turbines will likely be placed on upland sites, we anticipate that installation of associated new electrical lines or construction of roads associated with the turbines could necessitate crossings of Deer Creek and its tributaries or other occupied Topeka shiner streams in Brookings County. If this is the case, additional consultation may be necessary to address impacts to the Topeka shiner, and you should contact this office again for guidance on Best Management Practices to minimize potential impacts to the Topeka shiner once specific information on these structures is obtained.

The Western prairie fringed orchid has not recently been documented in South Dakota. However, it is recognized that the life cycle of the plant often makes it difficult to detect. Populations currently exist in the neighboring states of Nebraska, Minnesota, and North Dakota, and potential habitat may still be found in South Dakota. Although the plant is typically

associated with intact native prairie, the Western prairie fringed orchid has also been found on disturbed sites. Potential habitats generally include mesic upland prairies, wet prairies, sedge meadows, subirrigated prairies and swales in sand dune complexes. If these habitats exist within the proposed wind turbine site, surveys for the Western prairie fringed orchid should be considered prior to construction.

The Federal action agency for this project is the WAPA. If the WAPA, or their designated representative, determines that the project "may adversely affect" listed species in South Dakota, formal consultation should be requested 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. For more information regarding Federal action agency responsibilities as related to section 7 of the Endangered Species Act, please refer to the Service's Endangered Species Act Consultation Handbook which is available online at http://endangered.fws.gov/consultations/index.html.

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 34.

Sincerely,

Pete Gober
Field Supervisor
South Dakota Field Office

Enclosure

cc: NPWRC; Jamestown, ND
(Attention: Jill Shaffer)
Secretary, SDDGFP; Pierre, SD
(Attention: Alyssa Kiesow)

TOWER SITE EVALUATION FORM

1. Location (Provide maps if possible):
   State:_____ County:_____ Latitude/Longitude/GPS Grid:_____
   City and Highway Direction (2 miles W on Hwy 20, etc.)_____
   _____

2. Elevation above mean sea level: _____

3. Will the equipment be co-located on an existing **FCC licensed** tower or other existing structure (building, billboard, etc.)? (y/n)_____ If yes, type of structure:_____
   If yes, no further information is required.

4. If no, provide proposed specifications for new tower:
   Height: _____ Construction type (lattice, monopole, etc.):_____
   _____
   Guy-wired? (y/n)_____ No. bands:_____ Total No. Wires:_____
   Lighting (Security & Aviation):_____
   _____
   _____

If tower will be lighted or guy-wired, complete items 5-19. If not, complete only items 19 and 20.

5. Area of tower footprint in acres or square feet:_____

6. Length and width of access road in feet:_____

7. General description of terrain - mountainous, rolling hills, flat to undulating, etc. Photographs of the site and surrounding area are beneficial:
_____
_____
_____

8. Meteorological conditions (incidence of fog, low ceilings, etc.):_____
_____

9. Soil type(s):_____

10. Habitat types and land use on and adjacent to the site, by acreage and percentage of total:

_____
_____

11. Dominant vegetative species in each habitat type:_____

12. Average diameter breast height of dominant tree species in forested areas:_____

13. Will construction at this site cause fragmentation of a larger block of habitat into two or more smaller blocks? (y/n)_____ If yes, describe:_____

14. Is evidence of bird roosts or rookeries present? (y/n)_____ If yes, describe:_____

15. Distance to nearest wetland area (forested swamp, marsh, riparian, marine, etc.), and coastline if applicable:_____

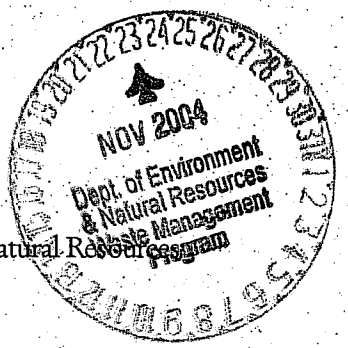
16. Distance to nearest telecommunications tower:_____

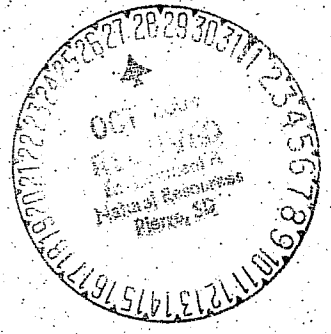
17. Potential for co-location of antennas on existing towers or other structures:_____

18. Have measures been incorporated for minimizing impacts to migratory birds? (y/n)_____ If yes, describe:_____

19. Has an evaluation been made to determine if the proposed facility may affect listed or proposed endangered or threatened species or their habitats as required by FCC regulation at 47 CFR 1.1307(a)(3)? (y/n) _____ If yes, present findings:_____

20. Additional information required:





October 25, 2004

Mr. Steve Pirner, P.E.
South Dakota Department of Environment and Natural Resources
Joe Foss Building
523 East Capitol
Pierre, SD 57501

RE: White 200 MW Wind Farm in Brookings County, South Dakota

Dear Mr. Pirner:

HDR Engineering, Inc. (HDR) is currently gathering environmental information for a 200 MW Wind Farm proposed by Navitas Energy in Brookings County, South Dakota. Navitas Energy has applied to interconnect the wind farm with Western Area Power Administration's (Western's) power system near White, South Dakota. HDR will submit the environmental information to Western to support Western's environmental review required under the National Environmental Policy Act (NEPA). Western must meet it requirements under the NEPA before granting the interconnection. HDR requests your review of the above-mentioned project to identify potential impacts from the project and any permits that the project might require.

Typically wind facility construction includes erecting wind turbines and constructing associated facilities such as gravel access roads and underground and overhead transmission lines. Although final turbine locations, access roads and electrical connections have not been determined at this time, the table below identifies sections potentially affected by the project:

Township Name	Township	Range	Sections
Lake Hendricks	111 N	47 W	6, 7, 18
Richland	111 N	47 W	19, 30, 31
Sherman	111 N	48 W	1-36
Afton	111 N	49 W	1, 12, 13, 24, 25, 36
Alton	110 N	48 W	2, 3, 4, 5, 6, 7, 8
Aurora	110 N	49 W	1, 12

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

Your input on the project will assist Navitas Energy, HDR, Western, and other permitting authorities in their review of this project. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. This notification precedes publication of the environmental documents but does not preclude subsequent review and comment on the documents after publication. Other formal opportunities to comment on the project will follow at a later date when a scoping meeting and public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 591-5434.

Sincerely,

Suzanne Lamb Steinhauer
Environmental Planner

Enclosures:
Project Location Map

Cc: Marcus da Cunha, Navitas Energy
Dirk Shulund, Western Area Power Authority

Waste Management Determination
Hazardous Waste/Solid Waste/Asbestos
It appears, based on the information provided, that this project will have little or no impact on the waste management in this area.
Approved By: Donn Kallevegn
Date: 11-23-04
South Dakota Department of Environment & Natural Resources
Phone: (605) 773-3153 Fax: (605) 773-6035

GREAT FACES. GREAT PLACES.

RECEIVED
DEC 3 2004
HDR Engineering, Inc.

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES
PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

December 1, 2004

Suzanne Lamb Steinhauer
HDR Engineering Inc
6190 Golden Hills Drive
Minneapolis MN 55416

Dear Ms. Steinhauer:

The South Dakota Department of Environment and Natural Resources (DENR) has reviewed the White 200 MW Wind Farm in Brooking County, South Dakota. The DENR finds that this construction should not cause violation of any statutes or regulations administered by the DENR based on the following recommendations:

1. The department does not anticipate any adverse impacts to the air quality of the state. The Air Quality Program has no objections to this project.

2. The department does not anticipate any adverse impacts to drinking waters of the state. The Drinking Water Program has no objections to this project.

3. The Waste Management Program does not anticipate any adverse impacts. The Waste Management Program has no objections to this project.

4. Best Management Practices (BMP) for sediment and erosion control should be incorporated into the planning, design, and construction of this project.

5. Wetlands and tributaries may be impacted by this project. These water bodies are considered waters of the state and are protected under the South Dakota Surface Water Quality Standards. The discharge of pollutants from any source, including indiscriminate use of fill material, may not cause destruction or impairment except where authorized under Sections 402 or 404 of the Federal Water Pollution Control Act. Please contact the U.S. Army Corps of Engineers concerning these permits.

6. The Ground Water Quality Program has reviewed the above-referenced project for potential impacts to ground water quality. Based on the limited information submitted in your correspondence dated October 25, 2004, the department does not anticipate adverse impacts to ground water quality by this project.

However, there have been accidental petroleum and other chemical releases throughout the state. Of the accidental releases reported to the department, we have identified several release cases in the vicinity of the town of White:

- Pesticide releases have been reported at Farmers Coop, ½ mile west & ¼ mile north of White, and have department release case numbers of 85.047, 92.169 & 85.000. These cases have been closed.
- Waste oil releases have been reported at B & G Oil, Hwy. 30, and have department release case numbers of 88.180 & 90.077. These cases have been closed.
- A diesel release was reported at Koch Services Inc., 1.5 miles east of town on Hwy. 30, and has a department release case number of 92.181. This case has been closed.
- A pesticide releases was reported 2 miles north of White, and has a department release case number of 95.114. This case has been closed.
- An abandoned tank was removed at 312 West Main Avenue, and has a department release case number of 95.114. This case has been closed.
- A fertilizer release was reported at 478th Avenue and 207th Street, and has a department release case number of 96.119. This case has been closed.

However, the location information provided to us regarding releases is sometimes inaccurate or incomplete. Therefore, other releases may have occurred that may affect the project area. If you would like to do more research regarding this and other accidental releases, information on accidental releases reported in South Dakota may be obtained at the following website: http://www.state.sd.us/denr/DES/ground/dataspil.htm.

In the unlikely event that contamination is encountered during construction activities, Navitas Energy or its designated representative must report the contamination to the department at (605) 773-3296. Any contaminated soil encountered must be temporarily stockpiled and sampled to determine disposal requirements and the materials of construction through the contaminated area should be evaluated for chemical compatibility and adjusted accordingly.

If you have any questions concerning these comments, please contact me at (605) 773-3351.

Sincerely,

John Miller
Environmental Program Scientist
Surface Water Quality Program

U.S. Department
of Transportation
Federal Aviation Administration

Great Lakes Region
Illinois, Indiana, Michigan,
Minnesota, North Dakota,
Ohio, South Dakota,
Wisconsin

2300 East Devon Avenue
Des Plaines, Illinois 60018

JAN 1 1 2005

RECEIVED

JAN 1 8 2005

HDR Engineering, Inc.

Ms. Suzanne Lamb Steinhauer
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

Dear Ms. Steinhauer:

Re: Comments Reference White 200 MW Wind Farm
in Brookings County, South Dakota

Thank you for the opportunity to provide additional comments on this project.

The Federal Aviation Administration conducted aeronautical studies on 13 proposed wind turbines earlier this year (ASN 2004-AGL-1455 through 1467-OE), in order to ascertain any possible impact upon the safety of air navigation and efficient use of navigable airspace by aircraft. Subsequently, Determinations of No Hazard to Air Navigation were issued for each of these studies.

Please note that these determinations are only concerned with the safe and efficient use of navigable airspace by aircraft, and do not relieve the sponsor of the wind farm of compliance responsibilities relating to any law, ordinance or regulation of any Federal, State or local government body.

Sincerely,

Cecelia L. Hunziker
Regional Administrator
Great Lakes Region

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Madison Wetland Management District
P.O. Box 48
23520 SD HWY 19
Madison, SD 57042
Telephone: (605) 256-2974
Fax (605) 256-9432
Email address: madisonwetlands@fws.gov

February 4, 2005

Brookings County Grassland Easements

Landowners in the following sections have expressed interest in receiving a grassland easement payment:

110-47 Section 6
110-48 Sections 1, 2, 3, 4, 5
111-47 Sections 4, 5, 6, 7, 8, 9, 17, 19, 27, 29, 30, 31, 33
111-48 Sections 22, 23, 24, 25, 26, 27, 34, 35, 36
112-47 Sections 29, 31, 32, 34
112-48 Sections 2, 10, 14, 23, 24, 25, 26, 36

Easements have been purchased on the following:

Section 4-111-47 SE1/4, NW1/4, S1/2S1/2NE1/4
Section 5-111-47 SW1/4, S1/2NW1/4, NW1/4SE1/4
Section 6-111-47 N1/2NW1/4
Section 7-111-47 W1/2, SE1/4
Section 26-111-48 S1/2, NE1/4, E1/2NW1/4
Section 24-111-49 W1/2
Section 32-112-48 N1/2
Section 33-112-48 W1/2
Section 24-112-48 NE1/4
Section 30-112-47 NE1/4SE1/4
Section 2-112-48 E1/2NE1/4, NW1/4NE1/4
Section 7-112-47 N1/2NE1/4
Section 8-112-47 N1/2NE1/4

Process of signing:

Section 36-111-48 W1/2W1/2, SE1/4NW1/4, SW1/4SW1/4

The FWS is primarily interested in protecting native sod in Townships 110, 111, 112 with Ranges 47 and 48.

March 28, 2006

Mr. Ted Eggebratten
Superintendent
Brookings County Highway Department
422 Western Avenue
Brookings, SD 57006

RE: White Wind Farm in Brookings County, South Dakota

Dear Mr. Eggebratten:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed, the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities, such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested Highway Department input on this project (October 25, 2004); that request was pursuant to an Environmental Impact Statement being completed by the Western Area Power Administration (Western). HDR requests any updates to your previous review of the above-mentioned project related to identifying potential impacts from the project and any permits that the project might require. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. Highway Department correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Mr. Robert Hill
Director
Brookings County Zoning & Drainage Office
County Resource Center
826 32nd Avenue
Brookings, SD 57006

RE: White Wind Farm in Brookings County, South Dakota

Dear Mr. Hill:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities, such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested Zoning Office input on this project (October 25, 2004). Your response of November 17, 2004 was used in preparation of environmental information submitted to the Western Area Power Administration (Western), as required by NEPA. HDR requests any updates to your previous review of the above-mentioned project as it relates to identifying potential impacts from the project and any permits that the project may require. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. Zoning Office correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

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6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Mr. Rex Fletcher
404 Permit Program
Environmental Protection Agency, Region 8
999 18th Street, Suite 300
Denver, CO 80202-2466

RE: White Wind Farm in Brookings County, South Dakota

Dear Mr. Fletcher:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested EPA input on this project (October 25, 2004); that request was pursuant to an Environmental Impact Statement being completed by the Western Area Power Administration (Western). HDR requests any updates to your previous review of the above-mentioned project related to identifying potential impacts from the project and any permits that the project might require. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. EPA correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Mr. Brad Crowder
Environmental Protection Specialist
Environmental Protection Agency, Region 8
999 18th Street, Suite 300
Denver, CO 80202-2466

RE: White Wind Farm in Brookings County, South Dakota

Dear Mr. Fletcher:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested EPA input on this project (October 25, 2004); that request was pursuant to an Environmental Impact Statement being completed by the Western Area Power Administration (Western). HDR requests any updates to your previous review of the above-mentioned project related to identifying potential impacts from the project and any permits that the project might require. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. EPA correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Ms. Cecilia Hunzinker
Regional Administrator
FAA - Great Lakes Region
2300 East Devon Avenue
Des Plaines, IL 60018

RE: White Wind Farm in Brookings County, South Dakota

Dear Ms. Hunzinker:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested FAA input on this project (October 25, 2004). Your response of January 18, 2005 was used in preparation of environmental information submitted to the Western Area Power Administration (Western), as required by NEPA. HDR requests any updates to your previous review of the above-mentioned project as it relates to identifying potential impacts from the project and any permits that the project may require. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. FAA correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Mr. Bruce Lindholm
Program Manager
South Dakota Aeronautics Commission
Becker Hanson Building
700 East Broadway
Pierre, SD 57501

RE: White Wind Farm in Brookings County, South Dakota

Dear Mr. Lindholm:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested Aeronautics Commission input on this project (October 25, 2004); that request was pursuant to an Environmental Impact Statement being completed by the Western Area Power Administration (Western). HDR requests any updates to your previous review of the above-mentioned project related to identifying potential impacts from the project and any permits that the project might require. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. Aeronautics Commission correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Mr. Steve Pirner, P.E.
South Dakota Department of Environment and Natural Resources
Joe Foss Building
523 East Capitol
Pierre, SD 57501

RE: White Wind Farm in Brookings County, South Dakota

Dear Mr. Pirner:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. vThe Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested DENR input on this project (October 25, 2004). Your response of November 29, 2004 was used in preparation of environmental information submitted to the Western Area Power Administration (Western), as required by NEPA. HDR requests any updates to your previous review of the above-mentioned project related to identifying potential impacts from the project and any permits that the project might require. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. DENR correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc.

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

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6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Mr. Leon Schochenmaier
Director, Division of Planning & Engineering
South Dakota Department of Transportation
700 East Broadway Avenue
Pierre, SD 57501

RE: White Wind Farm in Brookings County, South Dakota

Dear Mr. Schochenmaier:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested SDDOT input on this project (October 25, 2004); that request was pursuant to an Environmental Impact Statement being completed by the Western Area Power Administration (Western). HDR requests any updates to your previous review of the above-mentioned project related to identifying potential impacts from the project and any permits that the project might require. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. SDDOT correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc.

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Mr. Doug Backlund
South Dakota Department of Game, Fish and Parks
Foss Building
523 East Capitol
Pierre, SD 57501-3182

RE: White Wind Farm in Brookings County, South Dakota

Dear Mr. Backlund:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested SD DGFP input on this project (October 25, 2004). Your response of November 10, 2004 was used in preparation of environmental information submitted to the Western Area Power Administration (Western), as required by NEPA. HDR requests any updates to your previous review of the above-mentioned project as it relates to identifying potential impacts from the project and any permits that the project might require. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. SD DGFP correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Ms. Leslie Petersen
Environmental Review & Management
South Dakota Department of Game, Fish and Parks
Foss Building
523 East Capitol
Pierre, SD 57501-3182

RE: White Wind Farm in Brookings County, South Dakota

Dear Ms. Petersen:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested SD DGFP input on this project (October 25, 2004); that request was pursuant to an Environmental Impact Statement being completed by the Western Area Power Administration (Western). HDR requests any updates to your previous review of the above-mentioned project related to identifying potential impacts from the project and any permits that the project might require. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. SD DGFP correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Ms. Paige Hoskinson
South Dakota State Historical Society
Cultural Heritage Center
900 Governors Drive
Pierre, SD 57501-2217

RE: White Wind Farm in Brookings County, South Dakota

Dear Ms. Hoskinson:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested SHPO input on this project (October 25, 2004). Both HDR and Navitas are aware that Western's Section 106 consultation with SHPO is underway. We believe that the 106 consultation process will adequately address cultural resource issues for the PUC process as well. Therefore, this letter is being provided to the SHPO for information purposes only; no response is required.

Enclosed is a project location map for your information. If you have any questions relating to this matter, please contact me at (763) 278-5921.

Sincerely,
HDR Engineering, Inc

Michael Madson, M.S., RPA
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Mr. Steve Naylor
Regulatory Program Manager
U.S. Army Corps of Engineers
28563 Powerhouse Road, Room 118
Pierre, SD 57501

RE: White Wind Farm in Brookings County, South Dakota

Dear Mr. Naylor:
HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested USACE input on this project (October 25, 2004). Your response of November 10, 2004 was used in preparation of environmental information submitted to the Western Area Power Administration (Western), as required by NEPA. HDR requests any updates to your previous review of the above-mentioned project as it relates to Section 404 permits (Clean Water Act). This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. USACE correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Mr. Darrell Granbois
USDA – NRCS
Brookings County Field Office
205 6th Street
Brookings, SD 57006

RE: White Wind Farm in Brookings County, South Dakota

Dear Mr. Granbois:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested USDA input on this project (October 25, 2004); your response of November 1, 2004 was used in preparation of environmental information which is being used for an Environmental Impact Statement being completed by the Western Area Power Administration (Western). HDR requests any updates to your previous review of the above-mentioned project related to identifying potential impacts from the project and any permits that the project might require. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. USDA correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

March 28, 2006

Mr. Pete Gober, Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408

RE: White Wind Farm in Brookings County, South Dakota

Dear Mr. Gober:

HDR Engineering, Inc. (HDR) is currently preparing an application to the South Dakota Public Utilities Commission (PUC) for a permit to construct a 200 MW Wind Farm in Brookings County, South Dakota. The project would be located on approximately 105 acres located in sections 7-34 of Sherman Township (T11N, R48W) in eastern Brookings County, South Dakota, near the City of White. The Project is being proposed by White Wind Farm, LLC, a wholly owned subsidiary of Navitas Energy, Inc. As proposed the Project will include up to 105 wind turbine generators (WTGs), as well as associated facilities such as gravel access roads, underground and overhead collector lines, a project substation and electric interconnection facility.

HDR previously requested USFWS input on this project (October 25, 2004). Your response of November 19, 2004 was used in preparation of environmental information submitted to the Western Area Power Administration (Western), as required by NEPA. Both HDR and Navitas are aware that Western's Section 7 consultation with FWS is underway. HDR requests any updates to your previous review of the above-mentioned project for potential effects to known federally-listed threatened or endangered species and rare natural features. This updated information will be used in support of the PUC permit application.

Your input on the project will assist Navitas Energy, HDR, the PUC and other permitting authorities in their review of this project. USFWS correspondence will be included in the application to the PUC. If we do not hear from you within 30 days, we will assume that you have no comment on the project at this time. Other formal opportunities to comment on the project will follow at a later date when public hearings are held.

Enclosed is a project location map to facilitate your review. If you have any questions relating to this matter, please contact me at (763) 278-5911.

Sincerely,
HDR Engineering, Inc

Scott Reed, P.G.
Senior Environmental Scientist

Enclosures: Project Location Map

Cc: Paul Eberth, Navitas Energy

HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518
Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

December 15, 2005

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

Re: Request for Federally Listed Species, Candidates, and/or Critical Habitat for Navitas Energy's Proposed White Wind Farm, Brookings County, South Dakota

Dear Mr. Stas:

This letter is in response to your request dated October 4, 2005, for information regarding federally listed species/candidates/critical habitat that may occur within the project area for the Navitas Energy's White Wind Farm which is proposed southeast of the town of White in Brookings County, South Dakota.

In accordance with section 7(c) of the Endangered Species Act, as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species and candidate species may occur in the project area (this list is considered valid for 90 days):

Species	Status	Expected Occurrence
Bald eagle (Haliaeetus leucocephalus)	Threatened	Migration, Winter Resident, Possible Nesting.
Western prairie fringed orchid (Platanthera praeclara)	Threatened	Possible Habitat, No Recent Specimens.
Topeka shiner (Notropis topeka)	Endangered	Known Resident.
Dakota skipper (Hesperia dacotae)	Candidate	Resident in Northeastern South Dakota.

Bald eagles can be observed throughout the state of South Dakota, including Brookings County, any time of the year. The species winter in the state, and new nests are appearing each year. No construction should occur within one-quarter mile of any known active bald eagle nest. The species' nesting season is January to August. Any nests found should be reported to this office.

Topeka shiners are known to occupy numerous small streams within eastern South Dakota. It appears that portions of three known occupied waterways and/or their potentially occupied tributaries occur within the proposed project area; Deer Creek, Six Mile Creek, and Medary Creek all harbor this small endangered minnow. We recognize that wind turbines will likely be placed on upland sites, but the installation of the electrical lines or construction of roads associated with the turbines could necessitate crossings of these waterways. If the proposed lines may be installed underground, the U.S. Fish and Wildlife Service (Service) recommends utilizing directional boring, which generally avoids impacts to streams and is not likely to incur any impacts to the Topeka shiner. However, if trenching across streams is necessary, additional consultation may be needed to address impacts to the Topeka shiner with any proposed crossing. Dewatering of occupied stream segments potentially could result in take (as defined under the Endangered Species Act) of the Topeka shiner, particularly if pool habitats preferred by the species are dried. Stream crossings at sites that are already dry will not directly impact the species since no dewatering would be required; however, if trenching occurs at dry stream crossings, we recommend avoidance of any sites with potential spawning habitat (pool areas with sand or gravel substrate) and restoration of each site to pre-trench conditions in order to avoid a loss of instream habitat when water returns to the stream channel. To prevent sedimentation in the stream due to precipitation events or return/increase of flow to the stream, rigorous erosion control measures should be implemented on the disturbed area, and the site should immediately be restored after installation. Avoidance of instream work during the spawning period of May 15 to July 31 is recommended. If directional boring is not possible, trenching across these streams when water is present is unavoidable, or if roadways across these waterways are to be constructed, the Service recommends additional consultation with this office.

The Dakota skipper is known to occur in Brookings County; records of the species exist in areas located within ten miles of the project site. The Dakota skipper is a candidate species and accordingly is not at the present time provided Federal protection under the Endangered Species Act. Their candidate status defines these butterflies as a species in decline that the Service believes needs to be listed as threatened or endangered, but listing is currently precluded by other priorities. Dakota skippers are obligate residents of high quality prairie ranging from wet-mesic tallgrass prairie to dry-mesic mixed grass prairie. In South Dakota, Dakota skippers inhabit dry-mesic hill prairies with abundant purple coneflower but also use mesic to wet-mesic tallgrass prairie habitats characterized by wood lily and smooth camas. If these habitats occur within the project area, the Dakota skipper may be present. The Service suggests avoidance of these habitats.

The Service has not designated critical habitat for any species within the project area.

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 34.

Sincerely,

Pete Gober
Field Supervisor
South Dakota Field Office

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES
PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

May 2, 2006

Scott Reed
HDR Engineering Inc
6190 Golden Hills Drive
Minneapolis, MN 55416-1518

Dear Mr. Reed:

The South Dakota Department of Environment and Natural Resources (DENR) reviewed the White Wind Farm project in Brookings County, South Dakota dated March 28, 2006. Based on the general information provided the DENR has the following comments:

The Air Quality Program

The department does not anticipate any adverse impacts to the air quality of the state. The Air Quality Program has no objections to this project.

The Surface Water Program

1. Best Management Practices (BMP) for sediment and erosion control should be incorporated into the planning, design, and construction.

2. A Surface Water Discharge (SWD) permit may be required if any construction dewatering should occur. Please contact this office for more information.

3. Surface water bodies may be impacted by this project. The discharge of pollutants from any source, including indiscriminate use of fill material, may not cause destruction or impairment except where authorized under Section 404 of the Federal Water Pollution Control Act. Please contact the U.S. Army Corps of Engineers concerning this permit.

4. A General Storm Water Permit for Construction Activities may be required. If you have any questions, please contact Al Spangler at 1-800-SDSTORM (1-800-737-8676).

The Drinking Water Program

The department does not anticipate any adverse impacts to drinking waters of the state. The Drinking Water Program has no objections to this project. However, it is requested that the rural water provider in the area be notified to ensure that the cable installations do not adversely impact the existing water distribution systems that may be present.

The Ground Water Quality Program

The department does not anticipate adverse impacts to ground water quality by this project.

However, there have been accidental petroleum and other chemical releases throughout the state. There is the possibility that this project may encounter contaminated material. If you would like to do research regarding accidental releases, information on accidental releases reported in South Dakota may be obtained at the following website: http://www.state.sd.us/denr/DES/ground/dataspil.htm. In the unlikely event that contamination is encountered during construction activities, PPM Energy, Inc. or its designated representative must report the contamination to the department at (605) 773-3296. Any contaminated soil encountered must be temporarily stockpiled and sampled to determine disposal requirements and the materials of construction through the contaminated area should be evaluated for chemical compatibility and adjusted accordingly.

The Waste Management Program

All waste material must be managed according to our solid waste requirements. Please contact the Waste Management Program if you have any questions about solid waste disposal requirements at (605) 773-3153.

Thank you for the submitting this information, however, the DENR requests the opportunity to review this project again when the information becomes more specific. If you have any questions concerning these comments, please contact me at (605) 773-3351.

Sincerely,

John Miller
Environmental Program Scientist
Surface Water Quality Program

APPENDIX E
THE BROOKINGS COUNTY ZONING ORDINANCE SECTION 1212, WIND ENERGY SYSTEM (WES) REQUIREMENTS

SECTION 1212. WIND ENERGY SYSTEM (WES) REQUIREMENTS

A. A. APPLICABILITY

The requirements of these regulations shall apply to all WES facilities except private facilities with a single tower height of less than seventy-five (75) feet and used primarily for on-site consumption of power.

B. B. FEDERAL AND STATE REQUIREMENTS

All WES shall meet or exceed standards and regulations of the Federal Aviation Administration and South Dakota State Statutes and any other agency of federal or state government with the authority to regulate WES.

C. DEFINITIONS

Construction. "Construction" means any clearing of land, excavation, or other action that would adversely affect the natural environment of the site or route but does not include changes needed for temporary use of sites or routes for non-utility purposes, or uses in securing survey or geological data, including necessary borings to ascertain foundation conditions.

High voltage transmission line. "High voltage transmission line" means a conductor of electric energy and associated facilities.

Large electric power facilities. "Large electric power facilities" means high voltage transmission lines.

Person. "Person" shall mean an individual, partnership, joint venture, private or public corporation, association, firm, public service company, cooperative, political subdivision, municipal corporation, government agency, public utility district, or any other entity, public or private, however organized.

Route. "Route" means the location of a high voltage transmission line between two end points. The route may have a variable width of up to 1.25 miles.

Utility. "Utility" shall mean any entity engaged in this state in the generation, transmission or distribution of electric energy including, but not limited to, a private investor owned utility, cooperatively owned utility, and a public or municipally utility.

D. GENERAL PROVISIONS

1. 1. Mitigation Measures

a. Site Clearance. The permittees shall disturb or clear the site only to the extent necessary to assure suitable access for construction, safe operation and maintenance of the WES.

b. Topsoil Protection. The permittees shall implement measures to protect and segregate topsoil from subsoil in cultivated lands unless otherwise negotiated with the affected landowner.

c. Compaction. The permittees shall implement measures to minimize compaction of all lands during all phases of the project's life and shall confine compaction to as small an area as practicable.

d. Livestock Protection. The permittees shall take precautions to protect livestock during all phases of the project's life.

e. Fences. The permittees shall promptly replace or repair all fences and gates removed or damaged during all phases of the project's life unless otherwise negotiated with the affected landowner.

f. Roads

(1) Public Roads. Prior to commencement of construction, the permittees shall identify all state, county or township "haul roads" that will be used for the WES project and shall notify the state, county or township governing body having jurisdiction over the roads to determine if the haul roads identified are acceptable. The governmental body shall be given adequate time to inspect the haul roads prior to use of these haul roads. Where practical, existing roadways shall be used for all activities associated with the WES. Where practical, all-weather roads shall be used to deliver concrete, turbines, towers, assemble nacelles and all other heavy components to and from the turbine sites.

The permittees shall, prior to the use of approved haul roads, make satisfactory arrangements with the appropriate state, county or township governmental body having jurisdiction over approved haul roads for construction of the WES for the maintenance and repair of the haul roads that will be subject to extra wear and tear due to transportation of equipment and WES components. The permittees shall notify the County Zoning Office of such arrangements.

(2) Turbine Access Roads. Construction of turbine access roads shall be minimized. Access roads shall be low profile roads so that farming equipment can cross them and shall be covered with Class 5 gravel or similar material. When access roads are constructed across streams and drainageways, the access roads shall be designed in a manner so runoff from the upper portions of the watershed can readily flow to the lower portion of the watershed.

(3) Private Roads. The permittees shall promptly repair private roads or lanes damaged when moving equipment or when obtaining access to the site, unless otherwise negotiated with the affected landowner.

(4) Control of Dust. The permittees shall utilize all reasonable measures and practices of construction to control dust.

g. Soil Erosion and Sediment Control Plan. The permittees shall develop a Soil Erosion and Sediment Control Plan prior to construction and submit the plan to the County Zoning Office. The Soil Erosion and Sediment Control Plan shall address the erosion control measures for each project phase, and shall at a minimum identify plans for grading, construction and drainage of roads and turbine pads; necessary soil information; detailed design features to maintain downstream water quality; a comprehensive revegetation plan to maintain and ensure adequate erosion control and slope stability and to restore the site after temporary project activities; and measures to minimize the area of surface disturbance. Other practices shall include containing excavated material, protecting exposed soil, stabilizing restored material and removal of silt fences or barriers when the area is stabilized. The plan shall identify methods for disposal or storage of excavated material.

2. Setbacks

Wind turbines shall meet the following minimum spacing requirements.

a. Distance from existing off-site residences, business and public buildings shall be one thousand (1,000) feet. Distance from on-site or lessor's residence shall be five hundred (500) feet.

b. Distance from centerline of public roads shall be two (2) times the height of the wind turbines, measured from the ground surface to the tip of the blade when in a fully vertical position.

c. Distance from any property line shall be two (2) times the height of the wind turbine, measured from the ground surface to the tip of the blade when in a fully vertical position unless wind easement has been obtained from adjoining property owner.

3. Electromagnetic Interference. The permittees shall not operate the WES so as to cause microwave, television, radio, or navigation interference contrary to Federal Communications Commission (FCC) regulations or other law. In the event such interference is caused by the WES or its operation, the permittees shall take the measures necessary to correct the problem.

4. Lighting. Towers shall be marked as required by the Federal Aviation Administration (FAA). There shall be no lights on the towers other than what is required by the FAA. This restriction shall not apply to infrared heating devices used to protect the monitoring equipment.

5. Turbine Spacing. The turbines shall be spaced no closer than three (3) rotor diameters (RD) measurement of blades tip to tip. If required during final micro siting of the turbines to account for topographic conditions, up to 10 percent of the towers may be sited closer than the above spacing but the permittees shall minimize the need to site the turbines closer.

6. Footprint Minimization. The permittees shall design and construct the WES so as to minimize the amount of land that is impacted by the WES. Associated facilities in the vicinity of turbines such as electrical/electronic boxes, transformers and monitoring systems shall to the greatest extent feasible be mounted on the foundations used for turbine towers or inside the towers unless otherwise negotiated with the affected landowner.

7. Electrical Cables. The permittees shall place electrical lines, known as collectors, and communication cables underground when located on private property. Collectors and cables shall also be placed within or immediately adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner. This paragraph does not apply to feeder lines.

8. Feeder Lines. The permittees shall place overhead electric lines, known as feeders, on public rights-of-way if a public right-of-way exists. Changes in routes may be made as long as feeders remain on pubic rights-of-way and approval has been obtained from the governmental unit responsible for the affected right-of-way. If no public right-of-way exists, the permittees may place feeders on private property. When placing feeders on private property, the permittees shall place the feeder in accordance with the easement negotiated with the affected landowner. The permittees shall submit the site plan and engineering drawings for the feeder lines before commencing construction.

9. Decommissioning/Restoration/Abandonment

    a. Decommissioning Plan. Within 120 days of completion of construction, the permittees shall submit to the County Zoning Office a

decommissioning plan describing the manner in which the permittees anticipate decommissioning the project in accordance with the requirements of paragraph (b) below. The plan shall include a description of the manner in which the permittees will ensure that it has the financial capability to carry out these restoration requirements when they go into effect. The permittees shall ensure that it carries out its obligation to provide for the resources necessary to fulfill these requirements. The County Zoning Office may at any time request the permittees to file a report with the County Zoning Office describing how the permittees are fulfilling this obligation.

b. Site Restoration. Upon expiration of this permit, or upon earlier termination of operation of the WES, the permittees shall have the obligation to dismantle and remove from the site all towers, turbine generators, transformers, overhead and underground cables, foundations, buildings and ancillary equipment to a depth of four feet. To the extent possible the permittees shall restore and reclaim the site to its pre-project topography and topsoil quality. All access roads shall be removed unless written approval is given by the affected landowner requesting that one or more roads, or portions thereof, be retained. Any agreement for removal to a lesser depth or for no removal shall be recorded with the County Zoning Office and shall show the locations of all such foundations. All such agreements between the permittees and the affected landowner shall be submitted to the County Zoning Office prior to completion of restoration activities. The site shall be restored in accordance with the requirements of this condition within eighteen months after expiration.

c. Abandoned Turbines. The permittees shall advise the County Zoning Office of any turbines that are abandoned prior to termination of operation of the WES. The County Zoning Office may require the permittees to decommission any abandoned turbine.

10. Height from Ground Surface. The minimum height of blade tips, measured from ground surface when a blade is in fully vertical position, shall be twenty-five (25) feet.

11. Towers.

a. Color and Finish. The finish of the exterior surface shall be non-reflective and non-glass.

b. All towers shall be singular tubular design.

12. Noise. Noise level shall not exceed 50 dBA, including constructive interference effects at the property line of existing off-site residences, businesses, and public buildings.

13. Permit Expiration. The permit shall become void if no substantial construction has been completed within three (3) years of issuance.

14. Required Information for Permit.

    a. Boundaries of the site proposed for WES and associated facilities on United States Geological Survey Map or other map as appropriate.

    b. Map of easements for WES.

    c. Map of occupied residential structures, businesses and public buildings.

    d. Map of sites for WES, access roads and utility lines.

    e. Location of other WES in general area.

    f. Project schedule.

    g. Mitigation measures.

ORDINANCE # 2005-01

AN ORDINANCE PROVIDING FOR THE AMENDMENT OF THE 1997 REVISED ZONING ORDINANCE

WHEREAS, Brookings County has previously adopted the 1997 Revised Zoning Ordinance; and

WHEREAS, the Brookings County, South Dakota, Board of County Commissioners deems it necessary, for the purpose of promoting the health, safety, and the general welfare of the County, to amend the 1997 Revised Zoning Ordinance.

THEREFORE, BE IT ORDAINED BY BROOKINGS COUNTY, SOUTH DAKOTA, that the 1997 Revised Zoning Ordinance of Brookings County be amended as follows:

SECTION A. That Article XII, Section 1212 be amended as follows:

1. Section D, General Provisions, be amended as follows:
   A. Item 2, Setbacks, be amended as follows:

      2. Setbacks
         Wind turbines shall meet the following minimum spacing requirements.
         a. Distance from existing off-site residences, business and public buildings shall be one thousand (1,000) feet. Distance from on-site or lessor's residence shall be one thousand (1,000) feet.

         b. Distance from the right-of-way (ROW) of public roads shall be 500 feet or one point one (1.1) times the height of the wind turbines, depending upon which is greater, measured from the ground surface to the tip of the blade when in a fully vertical position.

         c. Distance from any property line shall be 500 feet or one point one (1.1) times the height of the wind turbines depending upon which is greater, measured from the ground surface to the tip of the blade when in a fully vertical position unless wind easement has been obtained from adjoining landowner.

SECTION B. In all other respects the 1997 Revised Zoning Ordinance shall remain unchanged and is hereby re-ordained.

FIRST READING: January 18, 2005

SECOND READING: January 25, 2005

Chairperson, Brookings County
Board of County Commissioners

ATTEST:

Brookings County Auditor

SECTION 1212. WIND ENERGY SYSTEM (WES) REQUIREMENTS

A. A. APPLICABILITY

The requirements of these regulations shall apply to all WES facilities except private facilities with a single tower height of less than seventy-five (75) feet and used primarily for on-site consumption of power.

B. B. FEDERAL AND STATE REQUIREMENTS

All WES shall meet or exceed standards and regulations of the Federal Aviation Administration and South Dakota State Statutes and any other agency of federal or state government with the authority to regulate WES.

C. DEFINITIONS

Construction. "Construction" means any clearing of land, excavation, or other action that would adversely affect the natural environment of the site or route but does not include changes needed for temporary use of sites or routes for non-utility purposes, or uses in securing survey or geological data, including necessary borings to ascertain foundation conditions.

High voltage transmission line. "High voltage transmission line" means a conductor of electric energy and associated facilities.

Large electric power facilities. "Large electric power facilities" means high voltage transmission lines.

Person. "Person" shall mean an individual, partnership, joint venture, private or public corporation, association, firm, public service company, cooperative, political subdivision, municipal corporation, government agency, public utility district, or any other entity, public or private, however organized.

Route. "Route" means the location of a high voltage transmission line between two end points. The route may have a variable width of up to 1.25 miles.

Utility. "Utility" shall mean any entity engaged in this state in the generation, transmission or distribution of electric energy including, but not limited to, a private investor owned utility, cooperatively owned utility, and a public or municipally utility.

D. GENERAL PROVISIONS

1. 1. Mitigation Measures

a. Site Clearance. The permittees shall disturb or clear the site only to the extent necessary to assure suitable access for construction, safe operation and maintenance of the WES.

b. Topsoil Protection. The permittees shall implement measures to protect and segregate topsoil from subsoil in cultivated lands unless otherwise negotiated with the affected landowner.

c. Compaction. The permittees shall implement measures to minimize compaction of all lands during all phases of the project's life and shall confine compaction to as small an area as practicable.

d. Livestock Protection. The permittees shall take precautions to protect livestock during all phases of the project's life.

e. Fences. The permittees shall promptly replace or repair all fences and gates removed or damaged during all phases of the project's life unless otherwise negotiated with the affected landowner.

f. Roads

(1) Public Roads. Prior to commencement of construction, the permittees shall identify all state, county or township "haul roads" that will be used for the WES project and shall notify the state, county or township governing body having jurisdiction over the roads to determine if the haul roads identified are acceptable. The governmental body shall be given adequate time to inspect the haul roads prior to use of these haul roads. Where practical, existing roadways shall be used for all activities associated with the WES. Where practical, all-weather roads shall be used to deliver concrete, turbines, towers, assemble nacelles and all other heavy components to and from the turbine sites.

The permittees shall, prior to the use of approved haul roads, make satisfactory arrangements with the appropriate state, county or township governmental body having jurisdiction over approved haul roads for construction of the WES for the maintenance and repair of the haul roads that will be subject to extra wear and tear due to transportation of equipment and WES components. The permittees shall notify the County Zoning Office of such arrangements.

(2) Turbine Access Roads. Construction of turbine access roads shall be minimized. Access roads shall be low profile roads so that farming equipment can cross them and shall be covered with Class 5 gravel or similar material. When access roads are constructed across streams and drainageways, the access roads shall be designed in a manner so runoff from the upper portions

of the watershed can readily flow to the lower portion of the watershed.

(3) Private Roads. The permittees shall promptly repair private roads or lanes damaged when moving equipment or when obtaining access to the site, unless otherwise negotiated with the affected landowner.

(4) Control of Dust. The permittees shall utilize all reasonable measures and practices of construction to control dust.

g. Soil Erosion and Sediment Control Plan. The permittees shall develop a Soil Erosion and Sediment Control Plan prior to construction and submit the plan to the County Zoning Office. The Soil Erosion and Sediment Control Plan shall address the erosion control measures for each project phase, and shall at a minimum identify plans for grading, construction and drainage of roads and turbine pads; necessary soil information; detailed design features to maintain downstream water quality; a comprehensive revegetation plan to maintain and ensure adequate erosion control and slope stability and to restore the site after temporary project activities; and measures to minimize the area of surface disturbance. Other practices shall include containing excavated material, protecting exposed soil, stabilizing restored material and removal of silt fences or barriers when the area is stabilized. The plan shall identify methods for disposal or storage of excavated material.

2. Setbacks

Wind turbines shall meet the following minimum spacing requirements.

a. Distance from existing off-site residences, business and public buildings shall be one thousand (1,000) feet. Distance from on-site or lessor's residence shall be one thousand (1,000) feet. (Ord. 2005-01, 1-25-05)

b. Distance from right-of-way (ROW) of public roads shall be 500 feet or one point one (1.1) times the height of the wind turbines depending upon which is greater, measured from the ground surface to the tip of the blade when in a fully vertical position. (Ord. 2005-01, 1-25-05)

c. Distance from any property line shall be 500 feet or one point one (1.1) times the height of the wind turbines depending upon which is greater, measured from the ground surface to the tip of the blade when in a fully vertical position unless wind easement has been obtained from adjoining property owner. (Ord. 2005-01, 1-25-05)

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