# 2.0 PROJECT DESIGN

This section provides information on the project design, participants, and components.

## 2.1 DESCRIPTION OF PROJECT

The Cotterel Wind Power Project is a 200 MW facility consisting of up to 98 wind turbines. The annual energy output from this facility will be approximately 650,000 MW hours.

The project site is located on Cotterel Mountain in Cassia County, Idaho, between the towns of Albion and Malta. The majority of the land is administered by the BLM. Two sections are administered by the IDL. The anticipated layout of the project is shown in Figure 2-1, with more detailed maps provided in Appendix B. The ROW grant has been assigned an identification number of IDI-33676 by the BLM.

As mentioned above, the project will consist of up to 98 wind turbines. Wind turbine is the collective term for the equipment that captures the kinetic energy in the wind and converts it to electrical generation. The major components include the blades and hub (collectively called the rotor), the nacelle, and the tower. Inside the nacelle are the gearbox, generator, and various other components critical for operation of the wind turbine. Depending upon the turbine design, the transformer will be located either in the nacelle or on the ground next to the tower. Figure 2-2 and Figure 2-3 are general schematics of typical wind turbines (Figure 2-3 is from *How Wind Turbines Work*, U.S. Department of Energy, 2004).

The wind turbines on Cotterel Mountain will be placed in locations that will provide the best balance of energy capture, safe construction, and minimum impacts on the environment. The environmental impacts of the project will be closely monitored during the construction, operation, and decommissioning of the project, as described in I. POD and II. Environmental Protection Measures; A. Sage-grouse Monitoring Protocol, B. Avian Fatality Monitoring Protocol, and C. Raptor Nesting and Migration Monitoring Protocol.

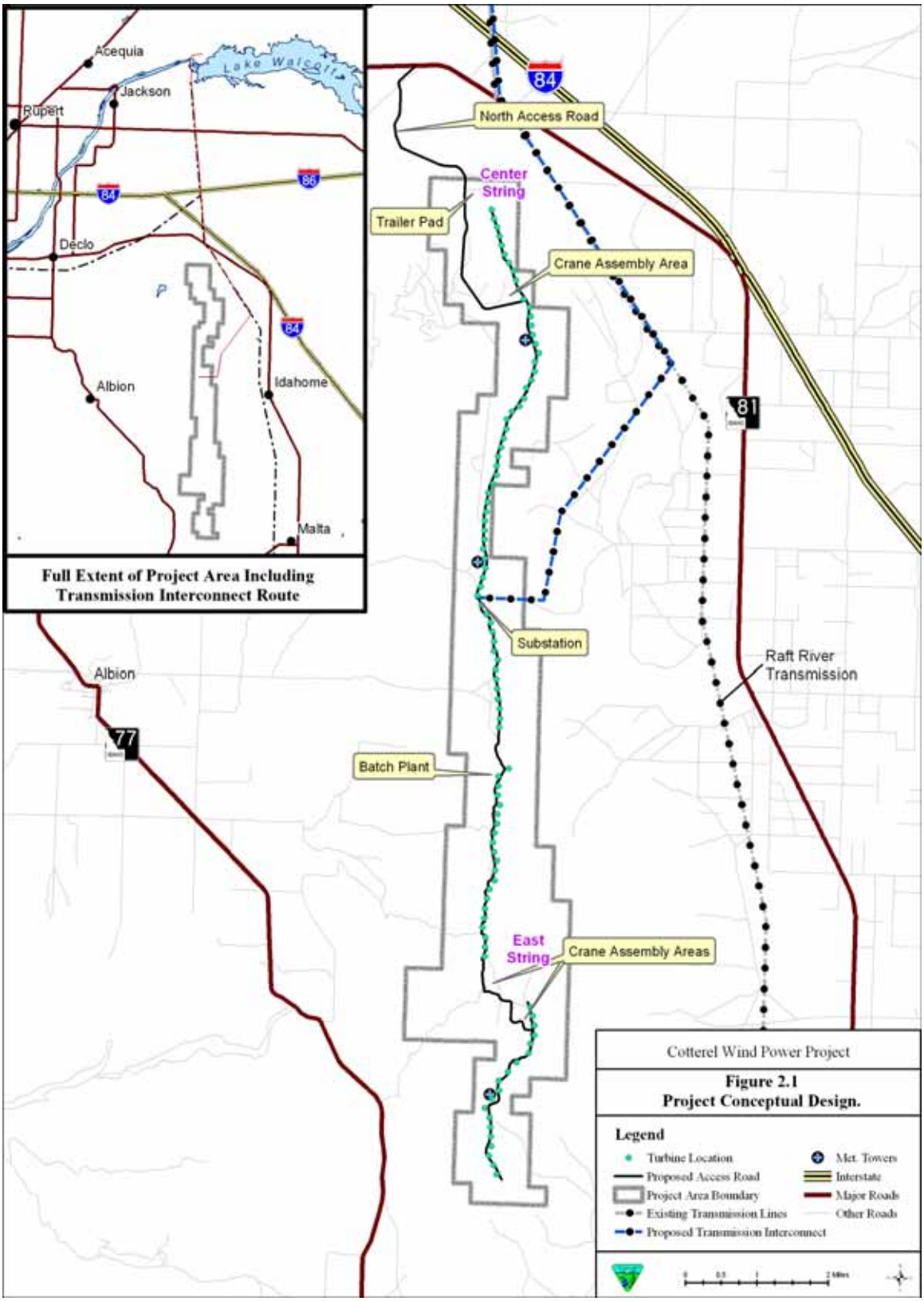


**Figure 2-1. Conceptual Design.**

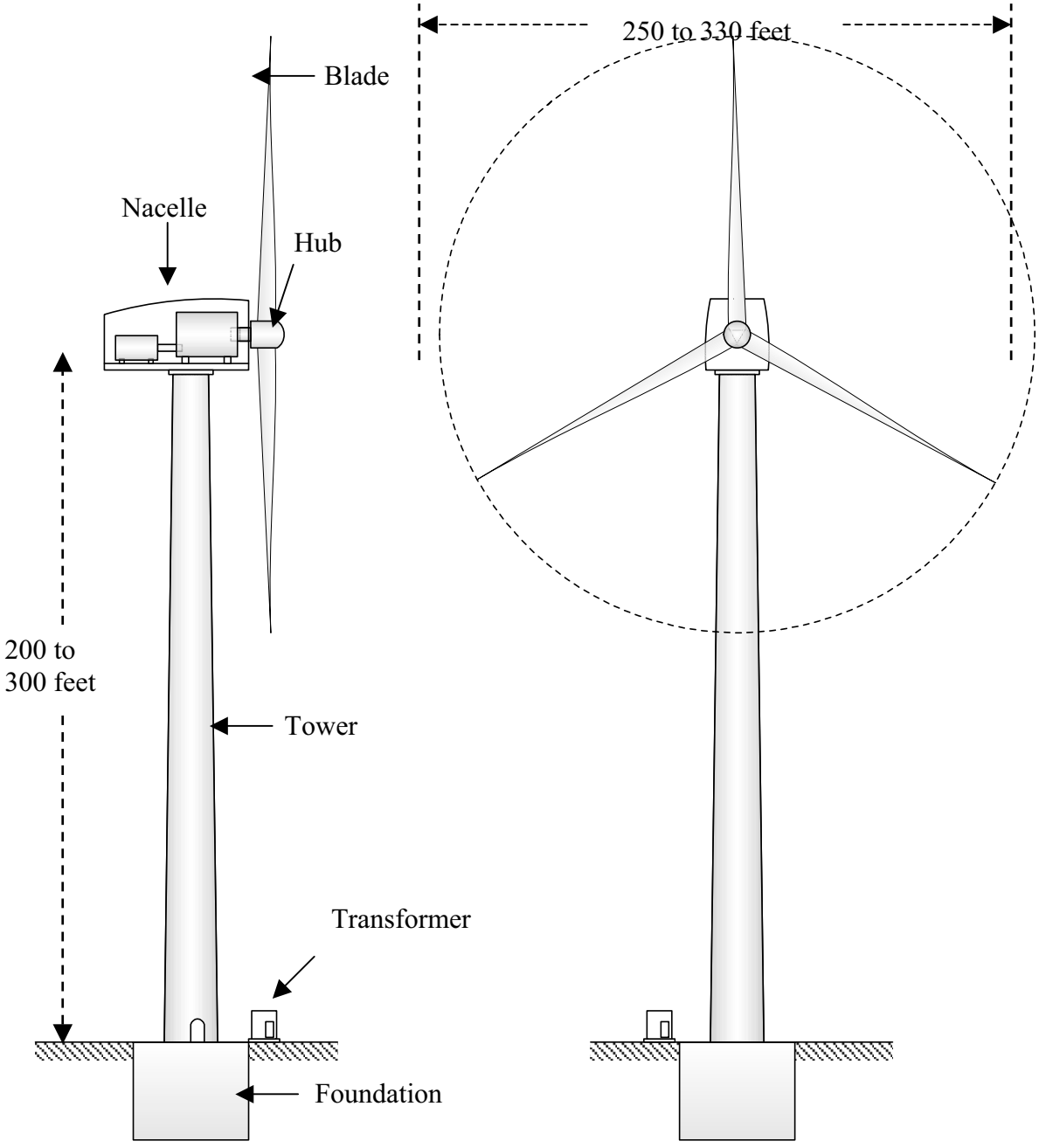


**Figure 2-2. General Wind Turbine Components.**

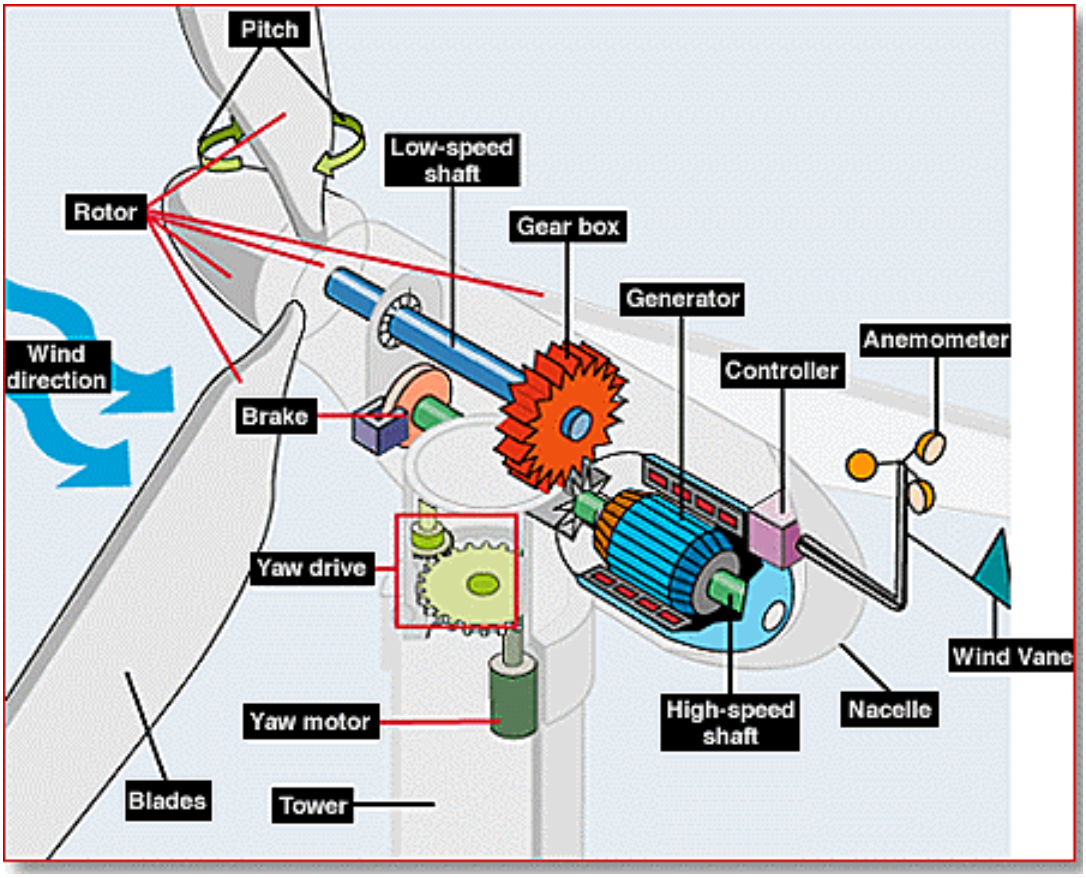


**Figure 2-3. General Wind Turbine Nacelle Components (US DOE).**

Wind turbines operate autonomously, based on wind speed and direction data. When the anemometer on a wind turbine senses winds within the operational range of the turbine, and power sensors find the electrical grid available to accept power, the wind turbine will turn itself on and begin to generate power. It will continue to generate until the wind speed is above or below the turbine operational range, the grid is no longer available, or the turbine detects a fault with one of its components. If a fault occurs, the turbine will shut itself down and, depending upon the nature of the fault, either wait for the condition to clear itself, or signal for maintenance.

Wind turbines are connected together through an underground electrical collection system to a central substation, where the power is raised to the voltage of the electrical grid. The turbines sit atop large concrete and steel foundations. Access roads interlink each turbine site. An Operations and Maintenance (O&M) building will be built on State of Idaho endowment land at the north end of the project. More information on each major project component is provided in Section 3.2.

## 2.2 DESCRIPTION OF ENVIRONMENTAL IMPACT STATEMENT

In March 2006, a Final Environmental Impact Statement (FEIS) was issued for the Cotterel Wind Power Project. The FEIS was assigned Serial Number FEIS 06-07 by the BLM. The FEIS is the culmination of studies and testing that began in early 2002.

The issues identified from interested parties for both the FEIS and this plan include:

- Sage-grouse conservation
- Maintaining and protecting tribal treaty rights and heritage links to public lands
- Protection of avian species, including migratory birds and raptors
- Threatened and Endangered Species protection
- Maintaining public access
- Visual resources protection
- Consistency with the Cassia Resource Management Plan

Several base studies and surveys have been performed for the project, and are discussed and referenced in the FEIS. Some key findings of the FEIS incorporated into this plan are:

- Sage-grouse lek locations
- Natural spring locations and sensitivities
- Sensitivity of pediocactus
- Requirement for noxious weed control

The FEIS is the base reference for details on the environmental aspects of the site, and the studies done in preparation of the project. This plan uses the results from the FEIS and best industry practices to plan the construction, operation, and decommissioning activities for the project.

## 2.3 PROJECT TEAM

Windland, Inc. is the applicant, holder of the ROW grant, and party responsible for implementing the POD. Supporting the development of the project are:

- **URS:** Third-Party Contractor for DEIS and FEIS
- **Black & Veatch**: Project Engineering and POD
- **Power Engineers**: Transmission and Substation Engineering

## 2.4 HEALTH, SAFETY, AND ENVIRONMENTAL COMMITMENT AND POLICY

Windland agrees that they and their employees, partners, and contractors are accountable for Health and Safety standards and protection of the environment.

## 2.5 ADAPTIVE MANAGEMENT STRATEGY

Adaptive management is a core management principle of this POD. It has guided planning for the design, development, management, and operation of the Cotterel Wind Power Project. It is intended to improve decisions regarding the planning, design, development, management, and operation of large engineering projects in relationship to their setting.

A general overview of adaptive management is in the *Cotterel Wind Power Project Final Environmental Impact Statement, March 2006*. Adaptive management is based upon the premise that ecosystems are complex and inherently unpredictable over time. It approaches

the uncertainties of ecosystem responses by evaluating and optimizing management actions using a systematic method from which "learning over time" is a critical tool. For the Cotterel project learning and adapting are based on a rigorous process of long-term monitoring and incorporation of best available science to determine impacts to wildlife.

The following is a synopsis of important characteristics of adaptive management identified by the Panel on Adaptive Management for Resource Stewardship, National Research Council, National Academy of Sciences, in its 2004 book titled *Adaptive Management for Water Resources Planning*. The Research Council's book consists of a review and analysis of the adaptive management literature from all fields of the past 20 years.

- **Management Objectives**. Management is an iterative process; competing paradigms among cooperating scientists and differences among stakeholders are inherent and unavoidable.
- **Range of Management Choices**. Paradoxically, existing data rarely point to a single best management policy. There are many considerations that go into good management, including knowledge gained over time.
- **Learning**. A mechanism for capturing and incorporating learning into future decisions should be a part of the long-term process.
- **Collaboration**. A collaborative structure should exist to assist in advising and feeding back to project owners and federal managers.
- **Modeling**. Models are helpful and have limits. It is important that everyone understand model assumptions and limits so that model results are not equated with reality.
- **Monitoring**. Monitoring should precede the project, be a part of project design, and continue after it is built.

The Cotterel FEIS was preceded by three years of biological monitoring, several years of meteorological monitoring, engineering studies, inter-agency and intra-agency discussions of potential issues and impacts, review of the known scientific literature, review of the histories of other U.S. and foreign wind energy projects, consultation with manufacturers of wind turbines, and consultation with seasoned professionals from many disciplines, including engineering, biology, hydrology, and meteorology.

The operation of the project will be continuously monitored, mechanically, electrically, meteorologically, and biologically. As information about the turbines and their relationships to the natural environment become available from monitoring over a meaningful duration of time, then adaptive management will be used to identify and recommend potential mitigation for emerging problems. As a result, the Cotterel Wind Power Project becomes a reference project for other wind projects proposed in the Western U.S.

It is important to recognize that the terms 'wind farm', 'wind project', etc. can be misleading. On Cotterel Mountain, turbines will be aligned in a linear string approximately one-quarter mile from one another and extend approximately 15 miles along the ridgeline. Each individual wind turbine is a separately controlled and monitored electrical generator. Each turbine occupies a unique air and ground space, or habitat, experiences unique wind and

weather, and is exposed to the migrations and flights of different birds and bats at different times. It is through understanding of the individual behavior of each turbine in relationship to its location through rigorous monitoring that will provide the opportunity to incorporate adaptive management principles.

The turbines on Cotterel Mountain will be capable of generating from 1.5 to 3.0 MW of electricity each. And each, depending on its location and the wind, will average from 30% to 35% of the output over the course of a year (its capacity factor). Depending on the model and manufacturer, each turbine will reach 325 to 465 feet in height from the ground to the tip of the highest blade, and will have a blade or rotor diameter of some 230 to 330 feet. In summary, each is an independent generating plant.

Adaptive management strategies in combination with long term monitoring are designed to recognize and respond to repetitive and recurring avian fatality incidents caused by individual turbines interacting with otherwise unpredictable natural events. Adaptive management strategies are not designed to permanently shut down turbines, or threaten the economic viability of the project.

By beginning early in the project planning process through pre-project monitoring, adaptive design, micrositing, lek and nest avoidance strategies, adaptive management reduces the probability of turbine operation interruptions. In addition, by continuing monitoring during construction and actual operations, a balance is reached between protecting the project's environment and assuring its ability to operate.

The following are a few examples of how adaptive management will be applied on Cotterel Mountain:

- Adaptive management will be used to refine the final location of the project access and site roads in order to avoid sage-grouse leks, nesting sites and other sensitive species. The initial design contains only a baseline from which to begin.
- Adaptive management will be used to microsite the final location of each turbine in order to avoid impacts on sage-grouse and golden eagles and their nesting sites. The initial design contains only conceptual baseline locations, not final locations.
- Adaptive management will be used to evaluate the information from long term fatality monitoring in order that the operator can make management decisions regarding the operation of individual turbines during periods of intense migrations or other hazardous conditions.
- Adaptive management will be used to respond to the needs of local livestock permittees in order to assure that their livestock are not endangered by construction activities and that access to food and water is not adversely impaired during construction.
- Adaptive management will be used to respond to local recreational, hunting, and other public uses of Cotterel Mountain to assure that multiple uses are continued without hazard to the health or safety of either the public using the recreational site or the project operators and workers employed at the site.

- Adaptive management will be used to continuously monitor the safety of workers and the public during construction of the project with a goal of zero injuries or accidents.

A Technical Steering Committee will be formed to advise on the design of mitigation measures and monitoring covered that will be funded by the compensatory mitigation fund. This committee will be responsible for recommending actions to the BLM Field Office Manager.

The intent is to ensure interagency involvement in mitigation and monitoring activities relating to migratory birds, bald and golden eagles, and sage-grouse with particular emphasis on addressing the requirements of the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and sage-grouse conservation. The committee will also examine ongoing research and scientific studies attempting to understand the behavior and relationship between wildlife and wind energy developments.

The Technical Steering Committee will consist of interagency wildlife and other resource professionals and Windland. This committee will be formed and chartered prior to any construction of the project.

The Core Technical Steering Committee will consist of the BLM, Windland, Idaho Department of Fish and Game, and the U.S. Fish and Wildlife Service. The Core Technical Steering Committee will be responsible for advising the BLM and Windland in several important scientific and technical areas, including:

- Evaluating impacts of the project to wildlife, including sage-grouse and raptors through scientific, statistically sound analysis and interpretation of the long-term monitoring data.
- Making recommendations to the BLM and Windland regarding possible mitigation and/or other initiatives, which may help to offset observed impacts which would be expected to result in a long-term adverse impact upon the ecosystem.
- Evaluate mitigation actions and provide oversight.

Ex Officio (Non Technical) members invited to the Technical Steering Committee meetings to dialogue and observe include the members of Native American Tribes, Local Sage-Grouse Working Group (if one is established), Cassia County, Community of Albion, Idaho Power Company, and Bonneville Power Authority.

Specific protocols for long-term avian fatality, sage-grouse, and raptor monitoring are contained in II Environmental Protection Measures.

## 2.6 COMMUNICATIONS PLAN

### 2.6.1 Bureau of Land Management

As the majority of the project site is on BLM-administered land, the BLM will play an active role during the development and construction of the Cotterel Wind Power Project. Windland

is coordinating the project design using the adaptive management approach endorsed by the BLM, and BLM representatives are being consulted at critical development stages of the project.

The BLM has appointed the Field Office Manager from the Burley, Idaho, office as the authorized officer for this project. Windland expects that this officer or designee will be present at the project site during much of the construction, and will observe construction activities to confirm they conform with this plan. The project construction manager will communicate directly with the representative on the site to keep the BLM apprised of the construction progress, and the results of environmental mitigation measures. This collaboration will continue as alternative mitigation measures are explored. Any deviations from the POD requested by Windland will be reviewed by the BLM Authorized Officer (or designee), and written approval obtained before such changes are made.

The BLM will also receive monthly reports during the construction, operation, and decommissioning of the project, containing the anticipated upcoming activities at the project and results of recent environmental monitoring. These reports are intended to maintain constant communication, and keep the BLM informed on mitigation results.

### 2.6.2 Idaho Department of Lands

Some of the project site land is administered by IDL. Approximately five percent of the project turbines are on IDL-administered land, as well as a portion of the project access road from Highway 81 and the O&M building. As such, Windland will also coordinate the design and construction of the Cotterel Wind Power Project with the IDL Area Manager, and will issue regular progress reports to IDL as well as the BLM. The IDL is also being consulted for the development of this plan, so that the final POD will be acceptable to both IDL and the BLM.

### 2.6.3 Local Government

Windland will maintain open communications with the local governments in the vicinity of the project site, including those of Cassia County, Minidoka County, City of Albion, City of Burley, and others. Informational updates will be provided to these local governments regarding activities that could impact their jurisdictions, including schedules for truck traffic and blasting. Specific coordination will be conducted for mitigation measures (such as coordination with Cassia County regarding noxious weed control).

Windland will request that each local government appoint a contact person to whom project updates will be sent. These governments will be given as much advance notice as possible for major project activities, as well as any changes to these schedules.

### 2.6.4 Public Information Kiosk (Interpretive Panels)

Windland understands that the development of a wind energy project on public land is of interest to many members of the general public. Windland will communicate information on the project through a website and at least one information kiosk. The information presented will include:

- Technical aspects on the project, including the rating, amount of energy generated, and equivalent number of typical homes served by the project.
- General description of activities on the site during construction and operation.
- Expected offset benefits of the project.
- Information on the environmental protection measures of the project, to demonstrate the diligence being taken to protect public lands.

By providing a kiosk, information will be provided to those members of the public interested in the project without requiring them to enter the site (and thereby enhancing public safety). The kiosk will be placed in a location near the project where it will be easily accessed by the public. An example of a public information kiosk from a wind energy project is shown in Figure 2-4.


**Figure 2-4. Example Public Information Kiosk.**

### 2.6.5 Artifacts

During the construction and decommissioning phases of the project, personnel will be alert for the unearthing of cultural, historical, or Native American artifacts. If any such potential artifacts are discovered, work will cease in that area and Windland will notify the BLM Authorized Office or IDL Area Manager (depending upon which section of land the artifacts are found) to request guidance with respect to the handling of the artifact and site. BLM/IDL will consult directly with the Idaho State Historic Preservation Office or appropriate Native American government officials.

*Prehistoric and Historic Resources*

Prior to construction, Eligibility Determinations and Determinations of Effect for sites identified in the inventory will be completed. Any activity planned inside the Area of Potential Effect (APE), as defined in the cultural resources inventory, will require inventory

and evaluation prior to any surface disturbing activities. A Memorandum of Agreement with the Idaho State Historic Preservation office, if needed, will be completed prior to construction. Any resources discovered during construction will be evaluated by the BLM/IDL Field Officer or designee prior to any further surface disturbing activities in that area.

*Native American Consultation*

Consultation with Tribal Governments will continue during construction to address Tribal concerns.

## 2.7 DESIGN APPROVAL PROCESS

While Plans of Development typically begin with project construction, Windland will communicate and collaborate with the BLM/IDL during the design phase as well. Such collaboration will keep all parties informed of the exact nature of activities and disturbed areas, so that any unnecessary disturbance of critical areas can be avoided.

Windland will prepare drawings and documentation of the project design at critical design phases, and provide these drawings to the BLM/IDL for review. The intention of these reviews is to evaluate the disturbed area of the project against the FEIS and POD, and provide feedback to Windland. The BLM/IDL is not expected to provide an independent review of the project engineering, nor provide formal "approval" of project drawings. The design phases when the drawings will be presented to the BLM/IDL include:

- Initial project layout and road alignment
- Completion of wind turbine micrositing and road alignment
- Drawings issued for bid
- Drawings issued for construction
- Final as-built drawings

The design aspects to be presented to the BLM/IDL for review include:

- Wind turbine locations
- Road alignment
- Stormwater drainage design
- Temporary construction laydown areas
- Temporary concrete batch plant location
- Permanent O&M Building location
- Electrical collection system alignment
- Substation location and arrangement
- Transmission line alignment
- Blasting

For those design aspects described above that impact IDL lands, Windland will issue those drawings to the IDL for review. The type and level of review from IDL is expected to be similar to that of the BLM/IDL (i.e. no independent engineering review or formal approval of the project design will be expected or required).