VALLEY COUNTY WIND ENERGY PROJECT

PUBLIC REVIEW ENVIRONMENTAL ASSESSMENT

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Bureau of Land Management
Montana Department of Environmental Quality
Western Area Power Administration
Montana Department of Natural Resources and Conservation

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EXECUTIVE SUMMARY

Proposed Action

Wind Hunter, LLC proposes to construct, operate and maintain a wind turbine electrical generation facility in Valley County, Montana, about 26 miles north of the city of Glasgow. The Valley County Wind Energy Project (VCWEP) would consist of an up-to-500-megawatt (MW) wind farm, a 34.1-mile 230 kilovolt (kV) transmission line interconnecting with the existing Fort Peck-to-Havre transmission line, at a new substation 7 miles west of Glasgow known as Antelope Creek Substation, a new access road, and ancillary facilities.

The purpose of the VCWEP is to use wind energy to operate a new renewable electrical generation facility that would help meet growing demands for electricity in the western U.S. Recent national and regional electrical demand forecasts predict that consumption of electrical energy will continue to increase into the foreseeable future and will require development of new resources to satisfy this demand.

The proposed 230kV transmission line would allow the proposed wind farm to be connected to the Fort Peck-to-Havre transmission line and to the existing interconnected transmission grid in the western U.S. Existing 37.5kV and 69kV transmission lines in the wind farm vicinity do not have sufficient available capacity to transport power generated by the proposed wind development. The proposed 230kV transmission interconnection line would meet this requirement.

Environmental Review Process

Review of the potential environmental impacts associated with the proposed wind farm, transmission line, interconnection, and access and operating facilities is required by the National Environmental Policy Act (NEPA) and Montana Environmental Policy Act (MEPA). The Bureau of Land Management (BLM) is the Federal Lead Agency and the Montana Department of Environmental Quality (DEQ) is the State Lead Agency for environmental review. The Western Area Power Administration (Western) and the Farm Service Agency (FSA) are Federal Cooperating Agencies. The Montana Department of Natural Resources and Conservation (DNRC) is a State Cooperating Agency.

BLM must do environmental review under NEPA to process the application for Right-of-Way for Wind Hunter to locate facilities on public lands under BLM management. Western is responsible for transmission interconnections to the Federal grid under its administration, and as such must comply with environmental review under NEPA when requests are made for interconnection and transmission service. The FSA must do environmental review due to Federal loans and other programs on private lands within the project area.

DEQ, as the State Lead Agency, is required to conduct MEPA environmental review for the transmission line based on an application submitted by Wind Hunter under the Major Facility Siting Act (MFSA) (75-20-101 et seq., MCA). For the transmission line to be constructed and operated, Wind Hunter must obtain a Certificate of Compliance from the State of Montana. DNRC, as the State Cooperating Agency, must do environmental review under MEPA to consider an easement for the transmission facilities on Montana School Trust Lands and for a wind farm lease for School Trust Lands.

As required by NEPA and MEPA, the Federal and State agencies have conducted a public scoping process and invited public comments on the content and issues that should be addressed in the environmental analysis and review process.

The analysis presented in this environmental assessment (EA) addresses the VCWEP proposal and alternatives, and is a stand-alone environmental review document. Where appropriate, the document tiers

off BLM's Final Wind Energy Development Programmatic Environmental Impact Statement (PEIS) and Record of Decision (BLM 2005). The PEIS describes the environmental impact types and ranges of impact magnitude associated with wind farm development on BLM lands in the western U.S, and offers general measures to mitigate potential impacts.

Proposed Facilities

The VCWEP would be constructed on private lands leased for wind energy development, lands managed by the BLM, and Montana School Trust Lands.

Development of the VCWEP may occur in up to four phases over about 10 years. Phase I is anticipated to begin operation in 2008. It would have 33 three-bladed 1.5MW wind turbines (50MW total) built on 1,094 acres. Phase II (2010) would have 63 turbines (100MW) built on 2,800 acres; Phase III (2013) would have 104 turbines (150MW) built on 5,520 acres; and Phase IV (2016) would have 134 turbines (200MW) on 10,706 acres. At full build-out (2016) the wind farm would have up to 334 turbines (500MW) on 20,120 acres. The schedule and configuration of each phase are reasonable estimates subject to change depending on the energy market and other variables.

Turbines would be about 390 feet tall and 14 feet in diameter at the base. Other facilities at the wind farm would include an operations and maintenance (O&M) building, a collector substation, an underground collector system, a new 2-mile-long primary access road from Kerr Road, an internal road network, and staging areas. The wind farm at full build-out would result in a total of 726.7 acres of disturbance out of 20,120 total acres. Of the total disturbance, 182.5 acres (e.g., roads, buildings, turbine foundations) would be permanently disturbed and 544.2 acres (e.g., work areas, rights-of-way) would be temporarily disturbed during construction and then reclaimed and revegetated. Most of the permanent ground disturbance would be the result of road construction.

The proposed transmission line, designated Transmission Route C, would extend 34.1 miles from the collector substation at the wind farm to the new Antelope Creek Substation. For much of this distance, Route C would parallel Cornwell Road. Most of the transmission line would be built with wood pole, H-frame structures 65 to 75 feet high. Right-of-way would be 110 feet wide. When the route crosses agricultural land and floodplain near the Milk River, light-duty steel single poles would be used. These would be 90 to 100 feet high, but would require only an 80-foot right-of-way. Use of Route C would result in 70.8 acres of permanent ground disturbance, mostly from access roads, and 75.6 acres of temporary disturbance, mostly from work areas, that would be rehabilitated and reseeded. New access roads would also be reseeded, but the road prisms would remain to allow for periodic maintenance of the line. Cornwell Road would remain open to public use.

The proposed transmission line would be configured at 230kV for all phases, although it would be energized initially to operate at 161kV. The transmission line would interconnect the wind farm to the new Antelope Creek Substation to be constructed on a 5-acre area 7 miles west of Glasgow next to NorthWestern Energy's existing Richardson Coulee Substation. The VCWEP would interconnect to Western's 161kV Fort Peck-to-Havre transmission line.

Alternatives to the Proposed Action

In addition to the No Action Alternative and the Proposed Action, this EA also evaluates impacts of an alternative designated Alternative A. Alternative A would include the wind farm as described above, the new Antelope Creek Substation, and Transmission Route A. Transmission Route A would extend 41.5 miles from the collector substation at the wind farm to the Antelope Creek Substation. For much of this distance, Route A would parallel Montana Highway 24, east of Transmission Route C. Route A and Route C follow the exact same route for the northernmost 4.6 miles and the southernmost 9.8 miles. As with Route C, most of the transmission line along Route A would be built with H-frame structures 65 to

75 feet high and would have a 110-foot right-of-way. This alternative would also use single poles when it crosses agricultural land and the floodplain near the Milk River. Use of Route A would result in 108.9 acres of permanent ground disturbance, mostly from access roads, and 88.8 acres of temporary disturbance, mostly from work areas.

Affected Environment and Environmental Consequences

The proposed wind farm at full build-out would encompass 20,120 acres. The area is characterized by gently rolling upland plateaus interspersed with swales and ephemeral drainages. The primary native vegetative community is short grass prairie. The more rugged Bitter Creek Wilderness Study Area (WSA) is located just to the north and west of the wind farm area. The northern part of the proposed transmission line (Route C) traverses terrain and vegetation similar to that of the wind farm. To the south the route parallels various stream drainages, and agricultural development becomes more common. At the southern end, Route C would cross the floodplain of the Milk River. The Antelope Creek Substation would be built next to the existing Richardson Coulee Substation south of the Milk River floodplain. The floodplain is predominantly agricultural with a cottonwood gallery forest along the river.

Land Use

The wind farm area is characterized by a rural landscape. No residences are located within the wind farm area; two are located within 0.25 mile of Route A, one residence is within 0.25 mile of Route C, and none within 0.25 mile of the proposed substation. Livestock grazing is the principal land use in the wind farm area, although non-irrigated cropland is present as well. The Bitter Creek WSA is located just north and west of the wind farm area. For both transmission corridors, livestock grazing is the principal land use, although irrigated and non-irrigated cropland is present. Irrigated cropland is found primarily in the Milk River Valley. The wind farm area and the transmission corridors contain a combination of BLM-administered public land, Montana School Trust Land, and private land.

During construction of the wind farm and transmission line, areas temporarily disturbed would be restored to their original condition. Livestock grazing, the primary land use in the area, could continue around wind farm facilities. Construction could temporarily affect recreational activities, such as hunting and hiking, in the wind farm area. However, most current recreation activity would be able to resume at current levels during operations and maintenance of the wind farm.

The Proposed Action would result in the permanent loss of 18.6 acres of agricultural land, and 239.5 acres of pasture/rangeland. Alternative A would result in the loss of 18.6 acres of agricultural land, and of 277.5 acres of pasture/rangeland. These losses are considered small given the amount of agricultural land and pasture/rangeland in the VCWEP area and in Valley County as a whole.

The BLM previously determined that there are no opportunities for Primitive and Unconfined Recreation in the Bitter Creek Wilderness WSA, so the proposed wind farm would have no impacts to this wilderness characteristic. Because the proposed wind farm would be built entirely outside the WSA boundary, it would not affect the wilderness characteristic of Naturalness. Outstanding Opportunities for Solitude was identified as a wilderness characteristic only for the eastern section of the WSA known as Bitter Creek East. The proposed wind farm would reduce the opportunities for solitude in this portion of the WSA. Also, there would be a short-term impact to solitude during the six-to-eight-month construction periods of the wind farm due to construction-related noise, dust, visual impacts, and possible temporary access restrictions. Most of the turbines within 1.0 mile of Bitter Creek East would be located on private land.

Overall, impacts on land use would be moderate to low because existing land uses (i.e., grazing, agriculture, recreation) could continue after the wind farm, transmission line, and interconnection substation are in operation.

Transportation

Access to the wind farm would be primarily via U.S. Highway 2, Montana Highway 24, and Kerr Road. A new primary access road would extend 2 miles into the wind farm area from Kerr Road (Refer to Figures 1.1-1 and 2.3-1). Construction of each phase of the wind farm might have some impacts on traffic (e.g., increased traffic, large vehicles, lane closures), but these would occur briefly and only during the six-to-eight month construction period for each phase. Likewise, construction of the transmission line might have short-term impacts on a few roads crossed or paralleled by the line. During operation of the wind farm and the transmission line, little traffic would be generated.

Tall structures, such as wind turbines (about 390 feet tall), meteorological towers (up to 184 feet), and transmission structures and poles (up to 100 feet), can create aviation hazards. The Proposed Action and Alternative A have been sited to avoid approach zones for known landing strips and runways. Also, the Federal Aviation Administration (FAA) will be contacted regarding the need for safety lighting on tall structures.

Visual Resources

The VCWEP was evaluated for scenic quality and visual integrity. Most of the area was classified as Class C (common), but Class B (above average) lands occur in the Milk River Valley and in some of major drainages (i.e., Spring Creek, Cherry Creek, Buggy Creek, Unger Coulee, Bear Creek, Black Coulee, Alkali Creek, and Antelope Creek). Also, Visual Resource Management (VRM) classes were identified for BLM lands in the area. Most BLM lands in the wind farm area are Class IV (11,151 acres), and there are few Class II lands (128 acres). No wind turbines would be placed on Class II lands. Route C would cross 0.9 mile of Class II lands and 11.7 miles of Class IV lands, while Route A would cross 0.9 mile of Class II lands and 10.9 miles of Class IV lands. (For definitions of VRM classes, refer to Section 3.4.2 of this document.)

Viewpoints assigned high sensitivity levels included occupied residences, Faraasen Park, the Bitter Creek WSA Wildlife Viewing Area and destination route (Britsch Road), and the Buffalo Country Interpretive Site. A moderate sensitivity level was assigned to Montana Highway 24, U.S. Highway 2, Glasgow Base Ponds Fishing Access Site and destination route, and Faraasen Park destination route along Montana Secondary 246.

Overall, at full build-out 174 of 334 wind turbines would have high visual impacts for sensitive viewers, and the remainder would have moderate visual impacts. Portions (4.3 miles) of Transmission Route C would have high impacts on sensitive residential and recreation viewers, while 5.6 miles of Transmission Route A would have high impacts on sensitive viewers. The Antelope Creek Substation would have moderate impacts on three residences.

Socioeconomics and Public Services

Valley County has a population of about 7,300 and has lost population since 1990. Glasgow has a population of about 3,100.

The estimated capital cost of all four phases of the wind farm would be $520 million, with peak Full-time Equivalent (FTE) construction jobs numbering 155 in Phase IV. Total FTE jobs (direct, indirect and induced) for all phases of wind farm construction would be 614. Route C would cost $8.4 million to $9.9 million to build, while Route A would cost $10.3 million to $12.0 million. Antelope Creek Substation would cost about $8 million. Construction wages would amount to over $20 million. Total estimated FTE jobs for operations would be 90, with annual operations (direct, indirect and induced) wages of almost $5 million.

Construction taxes would be over $2.2 million, and operations would result in annual taxes of almost $700,000. Rents and royalties would be paid to BLM, the State of Montana, and private landowners.

Annual BLM rent would be approximately $525,000, and annual State royalties would be approximately $262,000.

Existing public service providers in Glasgow and Valley County can accommodate short- and long-term population increases brought about by the Proposed Action.

Environmental Justice

There are no known environmental justice issues associated with the VCWEP. Consultation with Native American groups regarding cultural resources and other issues is ongoing.

Biological Resources

The proposed wind farm is anticipated to have moderate impacts to wildlife resulting from species displacement (temporary), habitat loss, habitat fragmentation, and bird and bat mortality caused by wind turbines. At full build-out (334 turbines) it is estimated that 402 to 600 passerines, 10 raptors, and 502 bats would be lost each year. Only 34 acres of mule deer winter range, out of 8,251 acres of winter range on the wind farm, would be permanently lost.

The wind farm at full-build-out would result in the permanent loss of about 101 acres of native vegetative habitats (mixed-grass prairie, prairie with silver sage, and breaks) and temporary loss of about 472 acres of these habitats.

Both Transmission Route A and Transmission Route C are expected to have low impacts on biological resources. There are four active grouse leks within 2 miles of Route C and three active leks within 2 miles of Route A. Route A would result in permanent loss of 112 acres of native habitat, compared to 70 acres for Route C. Route C would parallel linear (Cornwell Road), so its contribution to fragmentation of the grassland ecosystem would be relatively minor.

Water Resources and Wetlands

The Proposed Action is anticipated to have few impacts on water resources and wetlands. The wind farm would encompass the headwaters of several small streams, and the proposed primary access road would cross a small stream. About 60 wetlands are known to occur in the wind farm area, but direct impacts would be avoided. Transmission Route C would have 33 stream crossings and Route A would have 54 stream crossings. However, transmission structures and wind farm facilities would be sited and designed to avoid placement within streams and wetlands.

Geology and Geohazards

Approximately 8 percent of the wind farm area is on slopes greater than 8 percent, 1.6 miles (3.9 percent) of Route A, and 1.1 miles (3.2 percent) of Route C. Best road designs are on slopes of less than 8 percent due to constructibility. Shale of the Bearpaw formation is known to be susceptible to mass wasting and slope failure on moderate to steep slopes. Shale of this formations makes up 39 percent of the wind farm area. Approximately 1.2 miles is crossed by new access for Alternative A, and 0.8 mile is crossed by new access roads for Alternative C. Geotechnical investigations would be conducted, as appropriate, prior to construction of the wind turbines, roads, transmission structures, and other facilities to minimize impacts. Careful design, especially with respect to slopes greater than 8 percent that are on Bearpaw Shale, and implementation of Best Management Practices (BMPs) would minimize potential impacts.

Soils

The wind farm area at full build-out would contain 7,362 acres of soil with high erosion potential. Transmission Route A would contain 66 acres of soil with high erosion potential, while Route C would contain 48 acres of soil with high erosion potential. In either case, careful placement of access roads and structures and implementation of BMPs would minimize the risk of soil erosion.

Paleontology

No field investigations for paleontological resources have been performed in the VCWEP area, but existing data suggest a moderate potential in terms of both the probability of finding fossils and the likely importance of the fossils. Bearpaw Shale, Flaxville Formation, and Quaternary deposits all occur in the area and are considered to have moderate resource sensitivity. Pre-construction field investigations would facilitate avoidance of potential paleontological resources. However, improved access and the presence of construction workers could result in the accidental disturbance to these resources or in vandalism.

Cultural Resources

Less than 10 percent of the VCWEP area has been surveyed for cultural resources, very few cultural resources have been identified, and still fewer have been evaluated for eligibility to the National Register of Historic Places (NRHP). Known cultural resources include tipi rings, rock cairns, homestead sites, buildings, and other structures. One potential cultural landscape has been identified near Transmission Route C. It is anticipated that most NRHP-eligible cultural resources can be avoided during construction. However, additional investigation is needed to identify cultural resources in the area of potential effects and to assess physical and visual impacts on cultural resources. Consultation with Native American groups regarding cultural resources, including traditional cultural properties (TCPs), in the VCWEP area is ongoing but has not yet revealed any specific information. Procedures presented in a draft Section 106 Programmatic Agreement and a proposed Historic Properties Treatment Plan will be used to mitigate adverse impacts.

Health and Safety

There are few existing hazards in the VCWEP area, with fire being the primary health and safety risk. Potential risk of the Proposed Action and Alternative A would be related to fire from welding and lightning strikes; blasting; leaks and spills of fuels, hydraulic fluid, and other liquids; and falling debris. With implementation of appropriate safety plans and design standards, impacts to health and safety would be low. Also, various measures would be required to reduce the potential for the transmission line to cause telephone interference.

Noise

The VCWEP area is rural and noise levels are assumed to be about 40 dB(A) (average A-weighted decibels) during the day and 30 dB(A) at night. Certain construction activities can reach 60 to 70 dB(A) at 500 feet. These higher noise levels would not affect residences, and effects on visitors and wildlife would occur only during the day and during the construction period (up to eight months) for each phase. Operation of wind turbines would create noise levels of about 45 dB(A) at 0.5 mile, and noise at the edge of the transmission line right-of-way after construction would be about 57 dB(A). These levels are below EPA recommendations.

Air Quality

Construction of the wind farm and transmission line would create dust from construction clearing and vegetation removal, access roads, and other areas of disturbance. BMPs, such as watering in construction zones, would reduce the amount of fugitive dust. The Bitter Creek WSA is north and west of the wind farm area. Prevailing winds tend to blow from the west, so construction-related fugitive dust is not expected to be a problem in the WSA. Emissions from construction vehicles and equipment are not expected to have an appreciable affect on air quality.

Operating wind turbines do not produce emissions.

Cumulative Impacts

It is anticipated that existing agricultural, ranching, and recreation activities in the VCWEP area would continue with development of the wind farm and transmission line. Future actions in the VCWEP vicinity

may include oil and gas exploration and development. Depending on the number, location, and spacing of exploration and production wells; the nature and location of roads, pipelines, and other facilities; and measures required by the BLM, State of Montana, and private landowners, there could be a cumulative impact on water resources, biological resources, cultural resources, land use, visual resources, air quality, noise, and other resources.

Mitigation Measures

Committed mitigation measures are presented in Appendix A. Based on commitments adopted in the Decision Notice, BLM and DNRC will issue a Plan of Development (POD) concerning the VCWEP, Western will prepare a Mitigation Action Plan (MAP) where Western has jurisdiction, and DEQ will issue Environmental Specifications. Draft DEQ Environmental Specifications are presented in Appendix E.

CHAPTER 1 PURPOSE, NEED, AND BENEFITS

1.1 Introduction

Wind Hunter, a limited liability corporation (LLC), proposes to construct, operate and maintain a wind turbine electrical generation facility in Valley County, Montana, about 26 miles north of the city of Glasgow (Figure 1.1-1). The Valley County Wind Energy Project (VCWEP), as proposed, would consist of an up-to-500-megawatt (MW) wind energy development with up to 334 wind turbines of 1.5MW each (or equivalent), a 34.1-mile 230 kilovolt (kV) transmission line, and an interconnection substation. Constructing the interconnection facilities (i.e., transmission line and substation) would provide access for the VCWEP to the interconnected electric transmission grid in the western United States.

The VCWEP would be constructed in phases depending on the developing market for wind power. The first phase, proposed for completion in 2008, would include a 50MW facility with 33 wind turbines, the transmission line, and the new substation. The turbines and the transmission line would be constructed on private leased land, Montana School Trust Lands, and lands managed by the U.S. Department of the Interior (USDI) Bureau of Land Management (BLM).

The proposed transmission line would be configured at 230kV for all phases, although it would be energized initially to operate at 161kV. The transmission line would interconnect the wind farm to a new U.S. Department of Energy (DOE) Western Area Power Administration (Western) Antelope Creek Substation, to be constructed approximately 7 miles west of Glasgow next to NorthWestern Energy's (NWE) existing Richardson Coulee Substation. The VCWEP would interconnect to Western's Fort Peck-to-Havre Transmission Line, which operates at 161kV but is built to 230kV standards.

Review of the potential environmental impacts associated with the proposed wind farm, transmission line, interconnection, and access and operating facilities is required by the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4332) and by the Montana Environmental Policy Act (MEPA) (75-1-101 et seq., Montana Code Annotated [MCA]). Environmental review of the transmission line is also required by the Montana Major Facility Siting Act (MSFA) (75-20-101 et seq., MCA).

BLM is the Federal Lead Agency. BLM must do environmental review under NEPA to process the application for a Grant of Right-of-Way for VCWEP to locate facilities on public lands under their management. Federal Cooperating Agencies include Western and the U.S. Department of Agriculture (USDA) Farm Service Agency (FSA). Western is responsible for transmission interconnections and system reliability of the Federal grid under their administration, and as such must comply with environmental review under NEPA when requests are made for interconnection and transmission service. The FSA must do environmental review because of Federal loans and other programs on private lands within the project area.

The Montana Department of Environmental Quality (DEQ) is the State Lead Agency for environmental review. The Montana Department of Natural Resources and Conservation (DNRC) is a State Cooperating Agency. DEQ is required to conduct MEPA environmental review for the transmission line based on the application submitted under MFSA (see Section 1.3.2). For the 161/230kV transmission line to be constructed and operated, Wind Hunter must obtain a Certificate of Compliance from the State of Montana. DNRC must do environmental review under MEPA to consider an easement for the transmission facilities on Montana School Trust Lands and a wind farm lease of School Trust Lands. Wind Hunter submitted the VCWEP MFSA Application (POWER Engineers 2004) to the Federal and State agencies in December 2004, and responded to comments, coordinated with the agencies, and conducted biological and cultural resource field studies during 2005.

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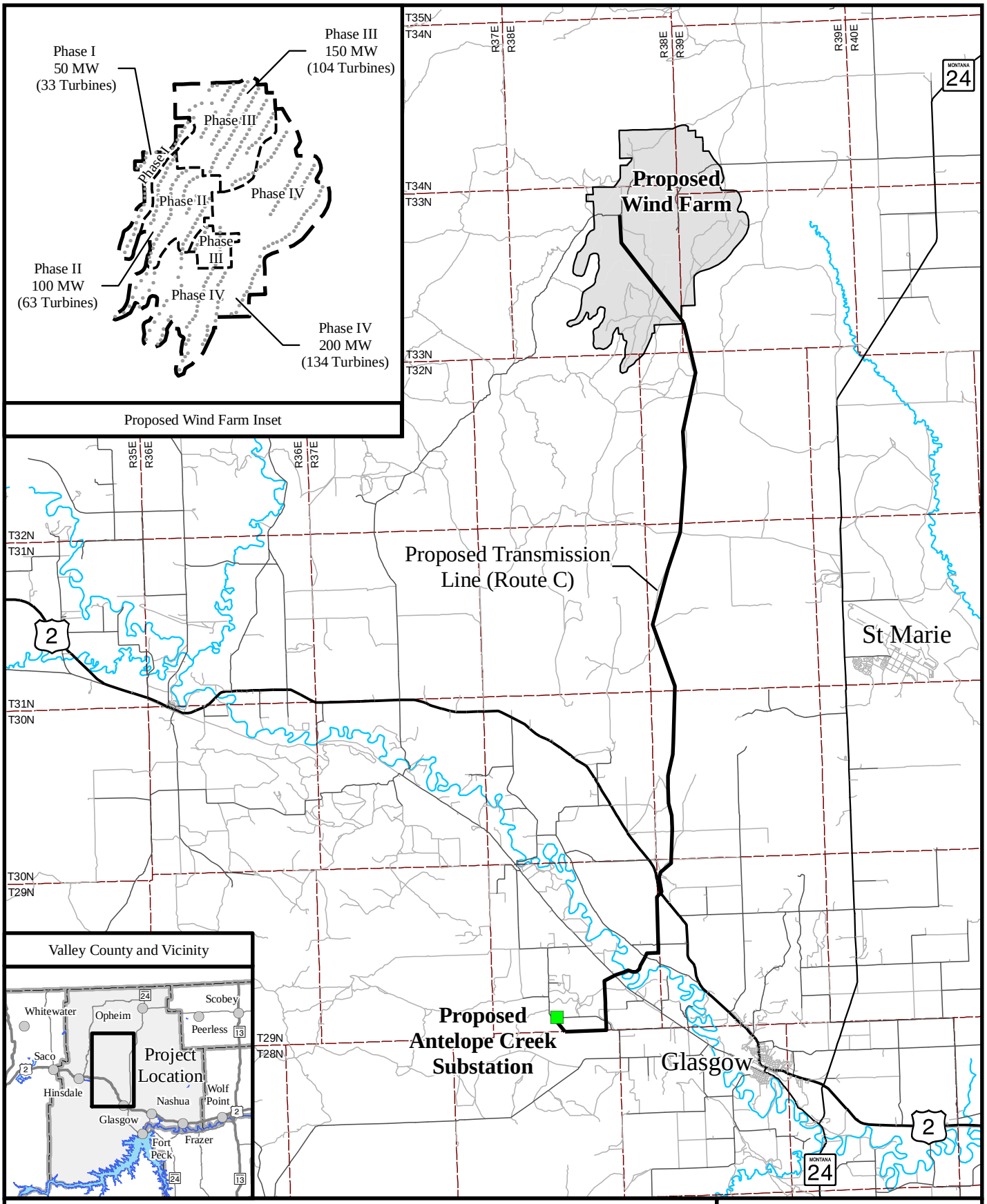

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WIND HUNTER

Figure 1.1-1
Applicant's Proposed Project

VALLEY COUNTY WIND ENERGY PROJECT

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Based on commitments adopted in the Decision Notice, BLM and DNRC will approve a Plan of Development (POD) concerning the VCWEP, and Western will prepare a Mitigation Action Plan (MAP) where Western has jurisdiction. DEQ has prepared draft Environmental Specifications that are included in Appendix E. Further development of these specifications will be coordinated with DNRC, Western and BLM. These specifications will be included in the Certificate of Compliance and the Decision Notice.

Wind Hunter currently has temporary rights on public lands managed by the BLM and School Trust Lands managed by the DNRC to conduct monitoring and testing of the wind resource. This is done by installing equipment on towers which measure wind speed, direction, and other variables. Three meteorological (MET) towers are currently located in the project area, and these towers are occasionally moved to accommodate testing requirements. One tower is currently on public lands and two are on privately held land (see Table 2.3-3).

Wind Hunter previously completed environmental inventory and analysis for the wind farm, interconnection transmission line (and alternative route), and operations and access facilities in the VCWEP MFSA Environmental Report (POWER Engineers 2004). The analysis within that document served as the application to DEQ to meet the requirements of MFSA and is available for review on DEQ's website (refer to Section 1.3.2).

The analysis presented in this environmental assessment (EA) addresses the VCWEP proposal and alternatives, and is a stand-alone environmental review document. Where appropriate, the document tiers off BLM's Final Wind Energy Development Programmatic Environmental Impact Statement (PEIS) and Record of Decision (ROD) (BLM 2005). The PEIS describes the types of environmental impact and ranges of impact magnitude associated with wind farm development on BLM lands in the western U.S, and offers general measures to mitigate potential impacts (see Section 1.3.1). Moreover, the PEIS establishes reasonable development standards, study requirements, and expected acceptable impact ranges. These are referenced when appropriate in this EA.

1.2 Purpose, Need, and Benefits of the Proposed Action

The purpose of the VCWEP is to use wind energy to operate a new renewable electrical generation facility that would help meet growing demands for electricity in the western U.S. Recent national and regional electrical demand forecasts predict that the growing consumption of electrical energy will continue to increase into the foreseeable future and will require development of new resources to satisfy this demand. For more information on electrical forecasts, refer to the MFSA Application (POWER Engineers 2004).

The DOE Energy Information Agency (EIA) is forecasting a 1.6 percent annual growth in electricity sales through 2030. This growth will require an increase in generating capacity of 347 gigawatts nationwide over the next 25 years. Deregulation of the electric industry and current energy supply issues have emphasized the need for new and diverse energy sources in the region. The EIA projects that generation of wind power will increase from 0.4 percent of total generation in 2004 to 1.1 percent in 2030 (EIA 2006).

On January 6, 1998 Western published in the Federal Register its Notice of Final Open Access Transmission Service Tariff (Tariff). Under Western's Tariff, the agency offers firm and non-firm point-to-point transmission service to the extent that it has available transmission capacity in excess of the capacity Western requires for the delivery of long-term firm capacity and energy to current contractual electrical service customers of the Federal government. The Tariff has been approved by the Federal Energy Regulatory Commission (FERC) as being consistent with FERC's Final Order Nos. 888, 888A, 888B, and 888C, which are intended to ensure non-discriminatory transmission system access. Pursuant to FERC' s Order Nos. 2003, 2003-A, and 2003-B, Western submitted revisions to its non-jurisdictional

Tariff on January 25, 2005 to revise certain terms of the original Tariff and to incorporate Large Generator Interconnection Procedures (LGIP) and a Large Generator Interconnection Agreement. FERC conditionally approved Western's Tariff on January 6, 2005. Consequently, Western must respond to interconnection and transmission service requests under the provisions of the revised Tariff. Also, Section 211 of the Federal Power Act requires transmission services be provided upon application if transmission capacity is available.

Western's LGIP and General Guidelines for Interconnection provide for transmission and system studies to ensure that transmission system reliability and service to existing customers is not adversely affected. The objectives of the applicant (Wind Hunter) must be considered. Because a statement of purpose and need affects the extent to which alternatives are considered reasonable, it is important to understand both the agencies' purpose and need as well that that of the applicant.

For the applicant, the proposed 161/230kV transmission line would fulfill purpose and need by connecting the proposed wind farm to Western's transmission line from Fort Peck to Havre and to the existing interconnected transmission grid in the western U. S., allowing access to the grid for power transport and sale. Existing 37.5kV and 69kV transmission lines in the vicinity of the project do not have sufficient available capacity to transport power generated by the various phases of the proposed wind development. The proposed 161/230kV transmission interconnection line would meet this requirement.

The need for wind energy is recognized at both the national and state levels. On August 8, 2005, the President signed into law the Energy Policy Act of 2005 (Public Law [PL] 109-58). This law establishes a National Energy Policy that promotes alternative and renewable energy sources, including wind energy. The law also extends the wind energy Production Tax Credit (PTC), which will be used to finance new wind farms.

The State of Montana has a Renewables Portfolio Standard (RPS) enacted in April 2005 through the Montana Renewable Power Production and Rural Economic Development Act (69-8-1001 et seq., MCA). As of September 2005, 21 states and the District of Columbia had adopted an RPS. The Montana standard requires public utilities to acquire a portion of their retail electricity sales from renewable sources, such as wind energy. These utilities must obtain 5 percent of their retail electricity sales from renewable sources during the years 2008 through 2009, 10 percent from 2010 through 2014, and 15 percent after 2014. Enactments in other states have similar provisions.

The benefits of the wind farm, transmission line, and substation facilities of the proposed VCWEP include:

- Wind energy is an inexhaustible and infinitely renewable energy source that will be available for future generations.
- Wind energy is economically competitive with today's rising coal and natural gas prices.
- Use of wind energy can reduce demand for other energy sources.
- Wind energy is a domestic resource.
- Although wind energy is not a stand-alone resource, is dependent on variable winds, and must be coupled with other generation sources to be marketed as firm power, wind energy is still considered to be a reliable energy resource.
- Wind energy produces no air pollutants or greenhouse gases.
- Wind energy is a source of revenue for property owners leasing land to wind developers, local residents hired for construction and maintenance jobs, and governments receiving tax payments and royalties from wind developers.

1.3 Relationship to BLM and Other Federal, State and Local Policies, Plans and Programs

1.3.1 BLM Wind Energy Development PEIS

Consistent with the President's National Energy Policy, the BLM established an Interim Wind Energy Development Policy (BLM 2002) to expedite projects that would increase energy production, transmission, and conservation. The BLM is building on the interim policy by establishing a Wind Energy Development Program. In June 2005, BLM prepared the Final Wind Energy Development PEIS (BLM 2005) to evaluate its proposed Wind Energy Development Program. The objectives of the PEIS were to: 1) assess the environmental, social, and economic impacts of wind energy development on BLM-administered land in an 11-state region, and 2) evaluate whether the proposed action presents the best management approach for the BLM to facilitate wind energy development and to mitigate potential impacts.

As a programmatic evaluation, the PEIS did not evaluate site-specific issues associated with individual wind energy development projects. Location-specific factors will vary considerably. Also, variations in project size and design will greatly determine the magnitude of impacts caused by particular projects. While the PEIS identifies the range of potential impacts and relevant mitigation measures, each wind energy development project on public lands managed by the BLM will be evaluated individually, and appropriate programmatic policies, Best Management Practices (BMPs) and local stipulations will be applied. Site-specific and project-specific issues are to be addressed during individual project reviews, which may tier off the PEIS but are not to be supplanted by it.

This EA describes the specific project impacts, mitigation and benefits of the VCWEP under BLM's program to allow wind development on suitable public lands in 11 western states. This EA tiers off the PEIS, incorporating appropriate procedures, plans, and impact mitigation techniques required in the program, but is a stand-alone and specific document for the VCWEP.

1.3.2 Montana Major Facility Siting Act Application

As required by MFSA (75-20-101 et seq., MCA), in December 2004 Wind Hunter submitted an application to DEQ for approval of the proposed 161/230kV transmission line. Upon making the findings required by MFSA and applicable administrative rules, Montana DEQ would issue a Certificate of Compliance for the transmission line. Where appropriate, this VCWEP EA has used portions of the MFSA Application pertaining to the existing environment and environmental consequences. The MFSA Application is available online at:

http://deq.mt.gov/MFS/WindHunter/application/WindHunterRevApp5_11_05.pdf

1.3.3 Transmission Interconnection

Western is currently responding to Wind Hunter's request for interconnection with Western's transmission system. Wind Hunter entered into a Transmission Service Agreement (TSA) with Western in March 2004 for firm point-to-point transmission service for 50MW. Under the 1998 Notice of Final Open Access Transmission Service Tariff and Section 211 of the Federal Power Act, Western is obligated to provide firm and non-firm point-to-point transmission service to the extent that it has available transmission capacity.

Wind Hunter and Western also entered into a Construction Agreement in March 2004 for Western to construct, own, and operate the Antelope Creek Substation for transmission interconnection at 161/230kV. Also addressed in both the Construction Agreement and the TSA are ancillary service for the integrated system, reactive supply and voltage control, regulation and frequency response service, energy

imbalance service, operating reserve or spinning reserve service, service and scheduling, system control and dispatch service.

Western is conducting a system impact and facilities study regarding the effects on the Fort Peck-to-Havre transmission line of the additional 50MW from the first phase of the wind farm. Any impacts to the system identified by Western will be addressed before interconnection is allowed (see Section 3.16). If any enhancements to the transmission system are required, Western will ensure that these enhancements are appropriately reviewed for environmental impacts under NEPA. This may require supplemental review or a separate environmental document. Such documents would be provided to DEQ.

In May 2006, NWE reported that after the Judith Gap wind farm in Wheatland County, Montana came on line, NWE's transmission system control performance was degraded, relative to Western Electricity Coordinating Council (WECC) standards, adversely affecting NWE's ability to continuously balance supply and demand in their control area. Similar problems have been experienced in Alberta and other small transmission systems after significant amounts of wind energy were added to the systems. This degradation of performance was related to the need to maintain spinning and regulating reserves, the unused capacity required to meet a rapid increase in electricity demand. Wind energy is non-firm because the wind does not blow 100 percent of the time, and wind farms cannot increase electricity output on demand. Obtaining sufficient regulation resources to remedy the problem may be a solution, but determining who would pay for the additional regulation – the generator, the power users, or all users of the transmission system – remains an industry issue. For the proposed VCWEP, Wind Hunter does not plan to have NWE as a customer for the electricity generated by the wind farm or to have NWE provide regulating reserves. This issue was discussed during development of the TSA with Western, and Wind Hunter would follow the normal process and would provide its own regulating resources (see Section 3.16, Electric Transmission Grid and Reliability).

1.3.4 Other Plans and Procedures

The U.S. Fish and Wildlife Service (USFWS) has developed guidelines to assist the wind industry in avoiding or minimizing impacts on wildlife by wind energy development.

Public lands administered by the BLM in the VCWEP area are guided by the Approved Valley Resource Management Plan (RMP) (September 1994), which is the Record of Decision document for the Final Judith Valley Phillips RMP and EIS (BLM 1992).

Lease agreements for School Trust Lands on the wind farm and easements for State Lands within the transmission line right-of-way will be consistent with DNRC plans and policies. The POD developed by BLM and DNRC will be built into DNRC's Lease Agreements.

The VCWEP is consistent with and supported by goals and objectives set forth in the Draft Valley County Resource Use Plan (Valley County 2003). This plan encourages appropriate energy resource exploration and development consistent with sound economic and environmental practices.

1.4 Authorizations, Permits, Reviews and Approvals

The VCWEP would conform to all relevant Federal, State and local statutes, regulations and plans. Table 1.4-1 lists the anticipated authorizations, permits, reviews, and approvals.

Table 1.4-1 Authorizations, Permits, Reviews, and Approvals

Action	Permit/Approval	Accepting Authority/Approving Agency	Statutory Reference
FEDERAL			
Transmission line construction and operation on land under Federal management	Right of Way (ROW) Grant	BLM	Federal Land Policy and Management Act (FLPMA) of 1976 (PL 94-579); USC 1761-1771; 43 CFR 2800
Request for transmission service and interconnection	Transmission Service Agreement (TSA)	Western	Open Access Transmission Tariff
NEPA compliance to grant Right-of-Way and Western Interconnection Agreement	Environmental Assessment (EA)	Western and BLM	National Environnemental Policy Act (NEPA), 40 CFR Part 1500 et seq., 43 CFR Part 2800
Construction, operation and abandonment of transmission lines across or within highway rights-of-way	Permit to cross Federal Aid Highway	Federal Highway Administration (FHWA)	23 CFR 1.23 and 1.27 USC Sections 116, 123, 315 (23 CFR Part 645 Subpart B); 23 CFR 77
Grant of Right-of-Way by BLM	Biological Assessment (BA), Biological Evaluation (BE), and Biological Opinion (BO)	USFWS	Endangered Species Act (ESA), Section 7
Grant of Right-of-Way by BLM	National Historic Preservation Act (NHPA) compliance, Section 106	BLM, Western, and Montana State Historic Preservation Office (SHPO)	National Historic Preservation Act (NHPA) of 1966; 36 CFR Part 800; 16 USC 47
Tower location and height relative to air traffic corridors	Notice of Proposed Construction or Alteration	Federal Aviation Administration (FAA)	49 USC 1501; 13 CFR 77, Objects Affecting Navigable Airspace
Fill in Waters of the U.S. and wetlands	Clean Water Act (CWA)	U.S. Army Corps of Engineers	Clean Water Act (CWA), Section 404; 33 CFR Parts 320-330
Development in a floodplain or new construction in a wetland	Floodplain Assessment and Findings; Adoption of the EA	Western	10 CFR Part 1022

Table 1.4-1Authorizations, Permits, Reviews, and Approvals (Continued)

Action	Permit/Approval	Accepting Authority/Approving Agency	Statutory Reference
STATE OF MONTANA			
Review of potential adverse water quality impacts associated with discharges of dredged or fill materials in wetlands and other Waters of the U.S.	Section 401, Water Quality Certification	Montana DEQ	Section 401 of the CWA
Storm water discharges to surface waters of the state associated with construction activities	General Discharge Permit for Storm Water Associated with Construction Activity	Montana DEQ	Montana Water Quality Act (75-5-401 et seq., MCA)
Construction and operation of certain transmission lines with a design capacity greater than 69kV	Certificate of Compliance	Montana DEQ	Major Facility Siting Act (MFSA) (75-20-101 et seq., MCA)
Authorizes short-term exemptions from certain surface water quality standards	Montana Joint Application: 318 Permit	Montana DEQ	Montana Water Quality Act (75-5-101, MCA)
Permit to excavate 10,000 cubic yards or more total aggregate from one or more pits regardless of surface ownership	Open Cut Permit (if new gravel sources are needed for VCWEP)	Montana DEQ	Open Cut Mining Act (84-4-401 et seq., MCA)
Construction activities on Montana School Trust Lands and navigable waterways	Easement/Land Use License	Board of Land Commissioners; Montana DNRC	Title 77, MCA
Use of State Lands for wind farm and transmission line	Lease Agreements; Easements	Montana DNRC	Title 77, Chapter 6, MCA
Grant utility crossing permits for transmission line and access roads that may encroach on state-maintained routes	Utility Crossing Permit	Montana Department of Transportation (MDOT)	RW 131 and/or RW 20

Table 1.4-1Authorizations, Permits, Reviews, and Approvals (Continued)

Action	Permit/Approval	Accepting Authority/Approving Agency	Statutory Reference
STATE OF MONTANA (Con't.)			
Consult with project applicants and state agencies regarding impacts on cultural resources that are listed in or eligible for listing in the National Register of Historic Places (NRHP)	Section 106 of the NHPA	Montana SHPO	Montana Antiquities Act (22-3-421 through 442, MCA)
Facilities construction	Building permits per relevant building codes	Montana Department of Labor and Industry, Building Codes Bureau	Title 50, Chapter 60 and Title 50, Chapter 74, MCA
VALLEY COUNTY			
Containment, suppression and eradication of noxious weeds on wind farm	Noxious Weed Management Program	Valley County Weed Control District	Title 7 (7-22-2101 through 2153, MCA)
Right-of-Way easement and road crossings for county property and roadways	Easement grants and road crossing permit	Valley County Commissioners	
Construction in or near perennial streams on public and private lands	Montana Joint Application	Valley County Conservation District	Montana Natural Streambed and Land Preservation Act (75-7-101 et seq., MCA)
Construction activity within a designated 100-year floodplain	Montana Joint Application; Flood Plain Development Permit	Montana DNRC; Valley County	Montana Floodplain and Floodway Management Act (76-5-401 to 406, MCA)

1.5 Scoping Process

The Federal and State agencies have conducted a public scoping process and invited public comments on the content and issues that should be addressed in the environmental analysis and review. More than 500 contact letters, along with a fact sheet and project map, were mailed on May 10, 2005. The scoping period was 45 days, lasting from May 10 to June 24, 2005. Comments received were the basis for the issues and concerns that are the focus of the environmental review in this EA.

BLM, Western, FSA, DEQ, and DNRC held public scoping meetings in Glasgow on May 24, 2005 and in Helena on May 26, 2005. BLM issued a news release about the upcoming meetings on May 16, 2005. Forty-one individuals attended the meeting in Glasgow; 12 attended the meeting in Helena. Presentations were made by the agencies and Wind Hunter about the VCWEP and the joint environmental review process; issues, concerns, and comments were recorded. In addition, comment forms were made available

for the public to submit written comments at and following the meeting. Verbal comments received during the meeting were recorded, posted, and incorporated into the issues and concerns that are the focus of this EA. Eighteen comment letters and written comment forms were received.

More information about the scoping process and meetings is included in a Scoping Summary Report (BLM, Western, DEQ, and DNRC 2005) (see also Section 4.3.3).

Also, as required by MFSA rules and procedures, Wind Hunter coordinated with local members of the communities, interest groups, and agencies to incorporate comments, issues and suggestions into the project proposal. During 2004, Wind Hunter held over 20 individual meetings with Federal and State agencies (Western, BLM, USFWS, DEQ, and DNRC), the Governor's Task Force on Transmission, the Montana Governor and staff, Valley County Commissioners, City of Glasgow, Northern and Valley Electric Cooperatives, Two Rivers Economic Growth, Inc. Board of Directors, several landowners and concerned citizens, and the Montana Environmental Information Center. Federal, State, county, and local agencies, tribes (see Section 4.3), and over 30 environmental interest groups and non-governmental organizations were contacted by Wind Hunter by letter in 2004. In addition, more than 90 persons attended a MFSA public scoping meeting held in Glasgow on August 17, 2004. While these meetings were not held as part of the NEPA/MEPA process, they did serve to inform the public about various aspects of the proposed project and assist with the development of scoping issues and concerns.

Among the issues raised during the scoping process were:

General

- Alternative locations for the wind farm and transmission line.
- Use of existing roads to serve the transmission lines.
- Transmission line right-of-way widths.
- Value of transmission line easements on State and BLM lands.

Cultural Resources

- Effects on tipi rings and other cultural resources.

Land Use

- Transmission line interference with use of private airstrips.
- Transmission line interference with farming activities.

Water Resources

- The need for new and upgraded creek crossings for the transmission line.

Biological Resources

- Impacts to grouse.
- Bird migratory patterns.
- Impacts of wind turbines on birds and bats.
- Effects on habitat for threatened and endangered species, and for other wildlife.
- Effects on ground squirrels and prairie dogs.
- Transport of noxious weeds.
- Need to replant with native grass varieties.

Socioeconomics

- Jobs brought to Montana.
- Number of workers to be employed during operations.
- Taxes received by Valley County.

Wilderness Study Area

- Effects of wind turbines on the solitude of the Bitter Creek Wilderness Study Area (WSA).

Visual Resources

- Visual and aesthetic impacts of the transmission line on homes and outfitting businesses.
- Views of the turbines from the Bitter Creek WSA.

Health and Safety

- Power frequency harmonics from the wind farm interfering with telephone communication.

CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES

2.1 Introduction

The proposed VCWEP, located north and west of Glasgow, Montana, would consist of an up-to-500MW wind farm, a 34.1-mile 161/230kV transmission interconnection with Western's Fort Peck-to-Havre transmission line, a new interconnection substation 7 miles west of Glasgow known as Antelope Creek Substation (refer to Figure 1.1-1), a new access road, and operations and ancillary facilities. Development of the VCWEP may occur in up to four phases over about 10 years. The VCWEP would be constructed on private lands leased for wind energy development, lands managed by the BLM, and Montana School Trust Lands. The No Action Alternative, the Proposed Action, and Alternative A, which includes an alternative transmission route, are discussed in detail in Section 2.3.

Various alternatives for wind farm development and transmission interconnection, including alternative technologies, underground transmission line construction, and alternative transmission routes, would meet the purpose and need to construct and operate the wind farm and interconnection facilities. However, all but the Proposed Action and Alternative A were eliminated because they would have cost more or would have had greater environmental impact (see Section 2.2.2 and Appendix H).

The following alternatives were eliminated from detailed consideration (see Section 2.2):

Wind Farm

- Alternative wind farm technologies
- Alternative location

Transmission Interconnection

- Underground transmission line construction
- Alternative routes except Route A

Transmission lines typically have one or more alternative routes that can be used to connect a wind farm into the electrical transmission system. Therefore, routing alternatives were initially identified in 2004, then analyzed and compared in the MFSA Application (POWER Engineers 2004). The comparison helped determine which routes would best meet environmental, engineering, and other siting criteria. Route A (Alternative A) and Route C (Proposed Action) were proposed by the agencies to be carried forward for analysis in this EA. Other alternative routes and route segments were eliminated from further consideration due to higher impacts.

The following sections are included in this chapter:

- The process used to evaluate alternative transmission line routes and alternative wind farm technologies and locations (Section 2.2).
- Descriptions of the No Action Alternative, Proposed Action, and Alternative A (Section 2.3).
- A comparison of the No Action Alternative, Proposed Action, and Alternative A (Section 2.4)
- A description of the Mitigation and Monitoring Plan (Section 2.5).

2.2 Alternatives Considered But Eliminated

The Lead and Cooperating Agencies for this EA have considered alternative wind turbine technologies; wind farm sizes; and transmission technologies, routes, and route widths. The alternatives considered and eliminated by the agencies from detailed analysis are described below.

2.2.1 Wind Farm Alternatives

Alternative Wind Energy Technologies

Table 2.2-1 compares various turbine technologies and offers the reasons for their elimination. Because the alternative technologies would not be as safe, environmentally sound, or economically viable as the Three-Bladed Upwind Wind Turbine that would be used for the VCWEP, they were considered and rejected as reasonable alternatives.

Table 2.2-1 Comparison of Wind Turbine Technologies

Technology Type	Typical Generator Size	Typical Height	Units Required for 500MW	Typical Rotation Speed[1]	Comment
Three-Bladed Upwind Wind Turbine	1.5MW	300-400 feet	334	10-23 RPM	Proposed VCWEP technology. Carried forward for detailed analysis.
Smaller Three-Bladed Upwind Wind Turbine	500-750kw	240-300 feet	667-1,000	28-30 RPM	Less cost effective than proposed technology. Somewhat greater environmental impact from ground disturbance due to larger number of turbines. Eliminated from detailed analysis because of inefficiencies, higher cost and greater environmental impact.
Darrieus Rotor	50-100kw	100-150 feet	5,000-10,000	50-70 RPM	Not considered to be commercially viable. Greater environmental impact than proposed technology from ground disturbance due to larger number of turbines. Eliminated from detailed analysis.
Two-Bladed Downwind Wind Turbine	50-200kw	150-200 feet	2,500-10,000	60-90 RPM	Not cost effective. Greater environmental impact than proposed VCWEP technology from rotor noise and ground disturbance due to larger number of turbines. Eliminated from detailed analysis.

[1] RPM = Revolutions per minute

Alternative Wind Farm Locations

The applicant's purpose for the VCWEP is to develop an economically feasible wind-powered electric generation facility in northeastern Montana. Wind Hunter has examined potential wind energy development sites throughout the western U.S., and is currently studying specific locations in New Mexico, Texas, California, northwestern and south central Montana, as well as northeastern Montana.

Wind Hunter began searching northeastern Montana for a suitable wind farm location in 1999, using several screening criteria:

- **The quality of the wind resource.** The siting of a wind farm is constrained by the need for a location with sufficient wind speeds on a regular basis throughout the year to allow a project to be both commercially and technically viable. The lack of a suitable wind resource could lead to operational problems and a lower return on investment.

- **The availability of land.** Are suitable public lands available for wind farm development? Are private landowners willing to negotiate lease agreements that allow for the installation of wind turbines and other facilities?

- **The availability of suitable transmission.** Wind farms must be located within a reasonable distance of an interconnection point on a transmission line with sufficient capacity to allow for the economical delivery of power to customers on the transmission grid. A reasonable distance is determined in part by the capital cost of transmission line construction.

DOE's National Renewable Energy Laboratory (NREL) has identified the VCWEP area as being a high wind resource area. The wind regime is Class 4 (Good) with some Class 3 (Fair). Direct wind measurements in the VCWEP area since 2004 (refer to Section 2.3.2 and Table 2.3-3) have confirmed that the resource is excellent. Not only are the wind speeds sufficient for wind farm development, but they are also relatively uniform throughout the year.

The VCWEP wind farm area contains a mixture of Federal, State, and private land. BLM and DNRC both support appropriate wind development on public lands they manage. BLM's Wind Energy Development PEIS and ROD (BLM 2005) provide the land use authorization for wind development (see Section 1.3.1). Wind Hunter also has lease agreements with landowners in the area.

Also, the proposed wind farm would be relatively close to a suitable transmission line. Construction costs would allow for economical deliver (Refer to Tables 2.3-6 and 2.3-11). Western's Fort Peck-to-Havre transmission line is located 35 to 40 miles south of the proposed wind farm and has sufficient capacity for electricity produced during the first phase of wind farm development, as discussed above (see also Section 1.3.3).

Other locations in eastern Montana with medium or high potential for wind energy development (BLM 2005) were evaluated by the applicant. A suitable wind regime was identified at Cameron Point on the Fort Peck Indian Reservation about 24 miles northeast of Glasgow and 15 miles southeast of the current proposal. The wind resource was studied by the applicant and an EA by the Bureau of Indian Affairs (BIA) was completed in 1999 that addressed a 50MW wind farm at that location. However, after a Finding of No Significant Impact (FONSI) was signed, tribal officials rejected the wind proposal. Developing a wind farm at Cameron Point was eliminated by the applicant as a reasonable alternative.

In 2001, the applicant used NREL wind speed mapping data to evaluate potential wind farm locations on private and public lands elsewhere in Valley County. The Opheim area, about 20 miles northeast of the VCWEP, showed suitable wind regimes on high ridges and flat plateaus. However, the distance from Opheim to the nearest existing transmission line with available capacity, Western's Fort Peck-to-Havre transmission line, is nearly 50 miles, a distance too great to make a wind generation project economically viable. Because of transmission cost, this potential wind development site was eliminated as a reasonable alternative.

Although there are other areas in the State of Montana predicted to have a wind resource adequate for producing energy at competitive prices, Wind Hunter has not developed relationships with the local

communities, agencies, or landowners in these areas; does not currently have wind leases on private lands; and has not acquired marketing or transmission information needed to develop a feasible project in these locations. Ground-based wind measurements, which typically require up to a year to collect, would be necessary to confirm the wind resources in other identified areas. Also, most potential locations would likely not be suitable for wind development because of site accessibility issues, distance to transmission, and other economic factors.

The VCWEP wind farm proposal is the only location determined by Wind Hunter to meet all its siting criteria (i.e., availability of a sufficient wind resource; proximity to a transmission line with available capacity; available public land and lease agreements with property owners). The wind resource is good; the proposed wind farm would be located on Federal, State, and leased private land; and it would be close to existing electric transmission. Therefore, the Lead and Cooperating Agencies for this EA are not considering any alternative wind farm locations.

If neither the Proposed Action nor Alternative A is approved by the agencies, wind farms would likely be built in other locations.

2.2.2 Transmission Alternatives

Underground Construction

Underground construction could reduce some potential impacts associated with an overhead transmission line and the presence of tall structures and conductors. Potential problems with underground construction (Table 2.2-2) include:

- Cost can be up to 10 times more than the cost of overhead construction (D. Tracy, personal communication 2006).
- Outages for underground transmission lines can take much longer to locate and repair than failures in overhead lines (J. Johnson, personal communication 2006).
- More extensive excavation required for construction of an underground transmission line than for installation of an overhead line could potentially increase certain types of ground disturbance-related environmental impacts.

For these reasons, an underground system was not considered a viable alternative and was eliminated from further consideration**.**

Table 2.2-2 Comparison of Overhead and Underground Transmission Lines

	Overhead Transmission Lines	Underground Transmission Lines
Construction Costs	$237,000-$313,000 per mile	$2-3,000,000 per mile
Maintenance Costs	$3000 per mile per year	$3000 per mile per year
Time Required for Repair	2 or 3 days	A few weeks to 6 months, if cable needs to be ordered.

Source: Darel Tracy, POWER Engineers, Inc., personal communication 2006
Jerry Johnson, POWER Engineers, Inc., personal communication 2006

Alternative Interconnect System and Voltage

Wind Hunter considered tying in to an existing Northern Electric Cooperative 69kV transmission line that runs along Highway 24 south to the Watley Substation east of Glasgow. The interconnection would be at the Fauth Substation, about 11 miles east of the proposed wind farm and adjacent to Highway 24. The line is limited to a 38MW rated load, with this limit being set by the conductor size and line voltage. Because of existing loads already on this line, the capacity would be limited to about 15MW (R. Malsam, personal communication 2006). The minimum interconnect requirement for Phase I of the VCWEP would be 50MW and no reasonable alternative exists to rebuild the Northern Electric Cooperative line. This alternative was eliminated from further consideration.

New 69kV Transmission Line

Wind Hunter's MFSA Application (POWER Engineers 2004) originally mentioned that for the initial phase of wind farm development, a single circuit 69kV transmission line might be built and that a parallel single circuit 230kV transmission line would be built for Phases II, III, and IV. The 69kV line would have had sufficient capacity to handle the 50MW of power generated by Phase I of the wind farm and would have been less expensive to construct. However, the 69kV transmission line proposal was eliminated from further consideration because a wider 250-foot-wide right-of-way would have been required along most of the route to accommodate the two parallel transmission lines, and there would have been greater potential environmental impact.

Alternative Transmission Routes

The closest transmission line potentially having capacity to handle the output from the wind farm is Western's Fort Peck-to-Havre transmission line. An interconnection with good access was needed and the Antelope Creek Substation location next to NWE's existing Richardson Coulee Substation was selected for this reason. With the wind farm site and the interconnection point on the Fort Peck-to-Havre transmission line (the proposed Antelope Creek Substation) as the two termini, Wind Hunter prepared a regional siting study in 2004 to identify reasonable alternative transmission routes.

The study area evaluated for transmission line route alternatives included over 2 million acres from the wind farm area south past the Milk River Valley. The study area included an area from Rock Creek on the west to Highway 24 on the east. Physical and topographic constraints, land use, habitats, and other factors were analyzed, and field observations were made. Five potential routes were identified in the VCWEP MFSA Application (POWER Engineers 2004).

Alternative transmission routes, designated A, B, D, and E, were compared to the Proposed Action (Route C); alternative routes without substantial environmental or economic advantages over the proposed route were eliminated from further consideration by the Federal and State agencies. This comparison and review identified Routes A and C as the transmission line routes to be considered in this EA. In addition, several route segments were considered and eliminated from further consideration. Alternative transmission routes and route segments eliminated from further environmental review are shown on Figure 2.2-1; reasons for their elimination are summarized in Table 2.2-3. Appendix H contains a table summarizing the potential impacts associated with the five routes (A, B, C, D, and E) addressed in the MSFA Application and the two modified routes carried forward (A and C) and analyzed in this EA.

Table 2.2-3 Alternative Transmission Routes and Segments Considered and Eliminated

Eliminated Route or Segment	Reason for Elimination
Jensen Trail Route (Route B)	This route is located between Transmission Routes A and C. It was eliminated from consideration because of relatively high project costs, higher agricultural conflicts, more visual impacts to nearby residences, and the crossing of hydric (wet) soils. Hydric soils are an indication of wetlands and could also result in greater temporary impacts due to construction difficulties. Route B would not use as much public land as Route C (Proposed Action) or Route A (Alternative A), but it would cross more land without nearby existing roads than the other two routes. Route B would also be very close to a sage grouse lek and would require major reroutes to mitigate potential impacts (see Appendix H).
Britsch Road Route (Route D)	This route, located farther west than other proposed routes, was eliminated because of higher project cost, private land conflicts, foreground visual impacts, conflicts with BLM visual resource management policies, the fact that Britsch Road is the principal access to the Bitter Creek Wilderness Study Area (WSA), and the higher likelihood of wildlife habitat fragmentation. South of Vandalia, this route would cross more big sage habitat, which is used extensively by sage grouse, than other routes. It would potentially affect two areas with center pivot irrigation systems and would potentially affect a private landing strip south of Vandalia (see Appendix H).
West Central Route (Route E)	This route was located west of Route C and east of the Britsch Road Route (Route D). This route was eliminated from further consideration because of the need for extensive new roads to provide construction access, greater conflicts on agricultural land, the more erosive soils that would have to be crossed, and the amount of wildlife habitat that would be disturbed. At the north and south ends, the route would not parallel any existing road or trail, which would make construction and maintenance access difficult. This route would substantially increase the potential for waterfowl mortality due to its proximity to a reservoir (see Appendix H).
Pipeline Segment	This route would be similar to Transmission Route A from the wind farm to a point west of Highway 24 near St. Marie. From there it would follow an existing gas pipeline southwest to the community of Tampico. This route would cross through the Montana Fish, Wildlife and Parks (MFWP) Tampico Conservation Easement Wildlife Management Area (WMA), would have diagonal crossing of irrigated and non-irrigated cropland, and would cross more cottonwood galleries along the Milk River. Grouse leks are found within 2 miles of this segment. There are few existing roads, which would limit access for construction and maintenance. Many residences occur near the corridor. There would also be compatibility issues with the pipeline (i.e., corrosion).
Conservation Easement Segment	This short corridor segment would extend from U.S. Highway 2 to Montana Secondary 246. It would cross through the Tampico Conservation Easement WMA. It would also require diagonal crossing of irrigated and non-irrigated cropland. This corridor would have considerable visual impact on one nearby single-family residence.
U.S. Highway 2 Buggy Creek Segment	This corridor segment would begin where the West Central Route (Route E) would cross Highway 2, but it would instead extend east along Highway 2 for several miles and then double back west and southwest. When combined with Routes D or E, described above, this segment would have constraints associated with either of those routes and would cross more private land than Route A and C. It would be a longer route and would also cause physical and visual impacts at the MDOT Vandalia (Glasgow) Rest Area.

Table 2.2-3 Alternative Transmission Routes and Segments Considered and Eliminated (Continued)

Eliminated Route or Segment	Reason for Elimination
Tampico Road Segment	This corridor segment would begin near where the West Central Route (Route E) would cross Montana Secondary 246. This segment would extend a short distance along Tampico Road before turning south. In addition to constraints associated with Routes D or E, described above, the segment would cross more private land than Routes A or C. When combined with Routes D or E, this segment would result in a longer transmission route with no obvious reduction in impacts when compared to Routes A or C. The corridor would cross the Tampico Conservation Easement WMA and would pass near the community of Tampico and near dispersed residences along Tampico Road.
Kirwin Road Segment	This corridor segment would begin in Tampico and extend south for 4 miles. Because of its proximity to a single-family residence along Kirwin Road, there would be high visual impact. This segment would also cross private land.
Billingsley Cutoff Segment	This route segment would begin along the Jensen Trail Route (Route B) and run southwest to Billingsley Road. This corridor would result in diagonal crossing of irrigated and non-irrigated cropland and cottonwood galleries along the Milk River. There are few existing roads, which would limit access for construction and maintenance. Two single-family residences nearby would experience high visual impact.
Original Route A, Southern Segment	This route was very similar to Transmission Route A discussed in Section 2.3.3, but ran closer to Glasgow rather than turning west north of Cut Across Road. The southern segment of Route A as originally proposed was eliminated from further consideration after it was determined that the segment would cross a subdivided area and would use more private land (see Appendix H).
Billingsley Road Segment	Segments of Route A and C along the south side of Billingsley Road just east of the proposed Antelope Creek Substation were eliminated from consideration because of safety concerns. A transmission line along this portion of Billingsley Road would have been too close to a private landing strip to allow for safe take-offs and landings.

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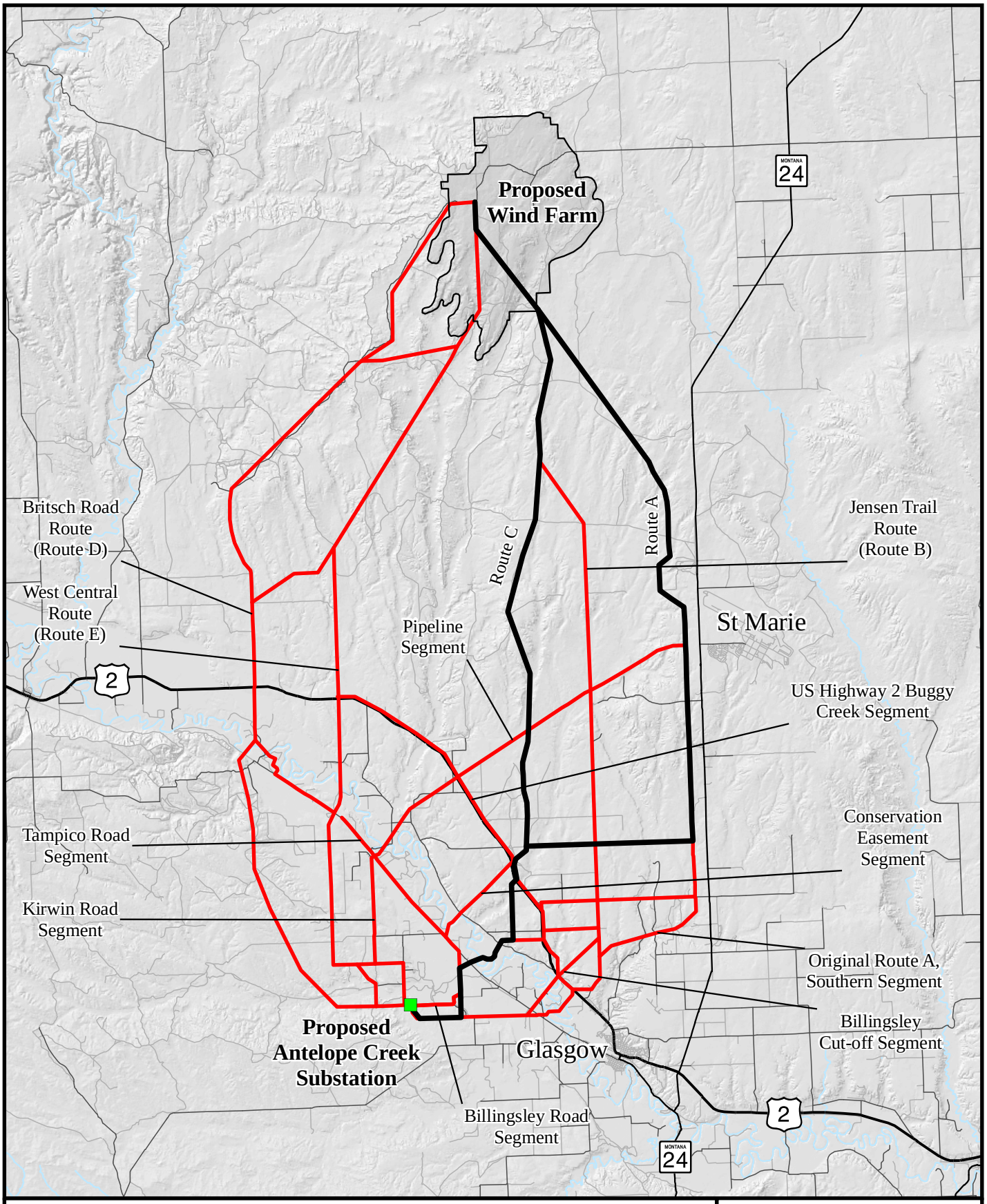

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Figure 2.2-1
Routes Considered
and Eliminated

VALLEY COUNTY WIND
ENERGY PROJECT

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2.3 Alternatives Evaluated in Detail

This EA evaluates three project alternatives in detail. These are the No Action Alternative (Section 2.3.1), the Proposed Action (Section 2.3.2), and Alternative A (Section 2.3.3). Alternative A is identical to the Proposed Action except for a difference in transmission route.

2.3.1 No Action Alternative

The No Action Alternative, required for consideration under NEPA regulations, means that no wind farm or interconnection facilities would be constructed on private, public lands managed by the BLM, and Montana School Trust Lands managed by the DNRC. The environmental impacts and benefits described in this EA (see Chapter 3) would not occur. Under No Action, Wind Hunter would attempt to find wind projects in other locations both inside and outside the state. Similar project operations could occur elsewhere to meet the demand for clean, renewable electrical generating facilities.

The No Action Alternative assumes that existing land uses and farming, ranching and rural lifestyles in Valley County would remain unchanged. Advantages of the No Action Alternative would include:

- No adverse environmental impacts from the construction and operation of the wind farm and interconnection facilities.

- Elimination or transfer to a different location of the financial costs and commitments associated with the construction and operation of the VCWEP.

Under the No Action Alternative, no lease benefits to Valley County landowners would occur, and the socioeconomic benefits of temporary and permanent jobs and tax revenues would either not occur or would be shifted to other areas.

BLM and DNRC both support appropriate wind development on public lands they manage, and BLM's Wind Energy Development PEIS and ROD (BLM 2005) provide the land use authorization for wind development as proposed by the VCWEP. DEQ has also promoted renewable energy developments.

2.3.2 Proposed Action

The VCWEP would consist of:

- A new access road from Kerr Road, wind turbine generators, internal wind farm roads, an electrical collector system, a collector substation, and operations and maintenance (O&M) facilities (e.g., O&M building and storage yard).

- An interconnection transmission line from the wind farm to the Fort Peck-to-Havre transmission line. Transmission Route C, along Cornwell Road and crossing the Milk River near Antelope Creek, is a component of the Proposed Action.

- A new interconnection substation known as the Antelope Creek Substation to be designed, constructed and operated by Western.

The design, construction, operation, and maintenance of the VCWEP would meet or exceed the requirements of the National Electric Safety Code (NESC), U.S. Department of Labor (DOL) Occupational Safety and Health Standards, and recognized requirements for safety and protection of landowners and their property.

Wind Farm

At full build-out, the wind farm would contain 334 1.5MW General Electric (or equivalent) wind turbines, generating a total of up to 500MW, in an area encompassing 20,120 acres (31.4 square miles). The wind farm would be constructed in phases summarized in Table 2.3-1 and illustrated in Figure 2.3-1.

The first phase of the wind farm would contain 33 1.5MW wind turbines (50MW total) in a 1,094-acre area (Figures 2.3-1 and 2.3-2). The 50MW size of Phase I was determined by the 50MW of capacity requested by Wind Hunter in Western's existing Fort Peck-to-Havre 161kV transmission line, and by a Transmission Service Agreement (TSA) for firm power transfer between Wind Hunter and Western. The phasing plan is a reasonably foreseeable approach to developing the VCWEP; however, economic, technological, and other factors would determine exact phasing and schedule. For this reason, the layouts of Phases II, III, and IV (Figure 2.3-1) have been shown in less detail than the Phase I layout (Figure 2.3-2). All layouts, including Phase I, are preliminary and subject to specific siting.

Prior to construction of each of the later phases, Wind Hunter will seek the approval of the Lead and Cooperating Agencies for modifications to project phasing, as required. Also, an approved POD would be required by the BLM and a lease agreement and POD would be required by DNRC on their respective lands prior to authorizing construction for each of the four phases.

Table 2.3-1 Wind Farm Development Phases

Wind Farm Phase	Number of 1.5MW Turbines	Power Generated (MW)	Acreage	Anticipated First Year of Operation[1]
I	33	50	1,094	2008
II	63	100	2,800	2010
III	104	150	5,520	2013
IV	134	200	10,706	2016
Full Build-Out	334	500	20,120	2016

[1] Phasing estimated by Wind Hunter subject to energy markets and other variables.

Up to 41 1.5MW wind turbines would be placed on State land (6 in Phase I, 0 in Phase II, 21 in Phase III, and 14 in Phase IV). DNRC must complete several actions before approving wind farm construction on State land:

- DNRC would reclassify the State land from its primary purpose of livestock grazing to the land classification of "other", which allows for a primary purpose of wind farm development.
- DNRC would withdraw the subject lands from the existing grazing leases.
- DNRC would issue the existing grazing lessee a grazing license that would allow existing grazing practices to continue subordinate to the dominant interest of the wind farm.
- DNRC would enter into a lease agreement with Wind Hunter that would allow the construction and operation of wind turbines and associated facilities on State School Trust Land. Estimated installation payments and annual rentals to the State of Montana are discussed in Section 3.5.2 Socioeconomic and Public Services.

The wind farm facility, once constructed, would operate year-round.

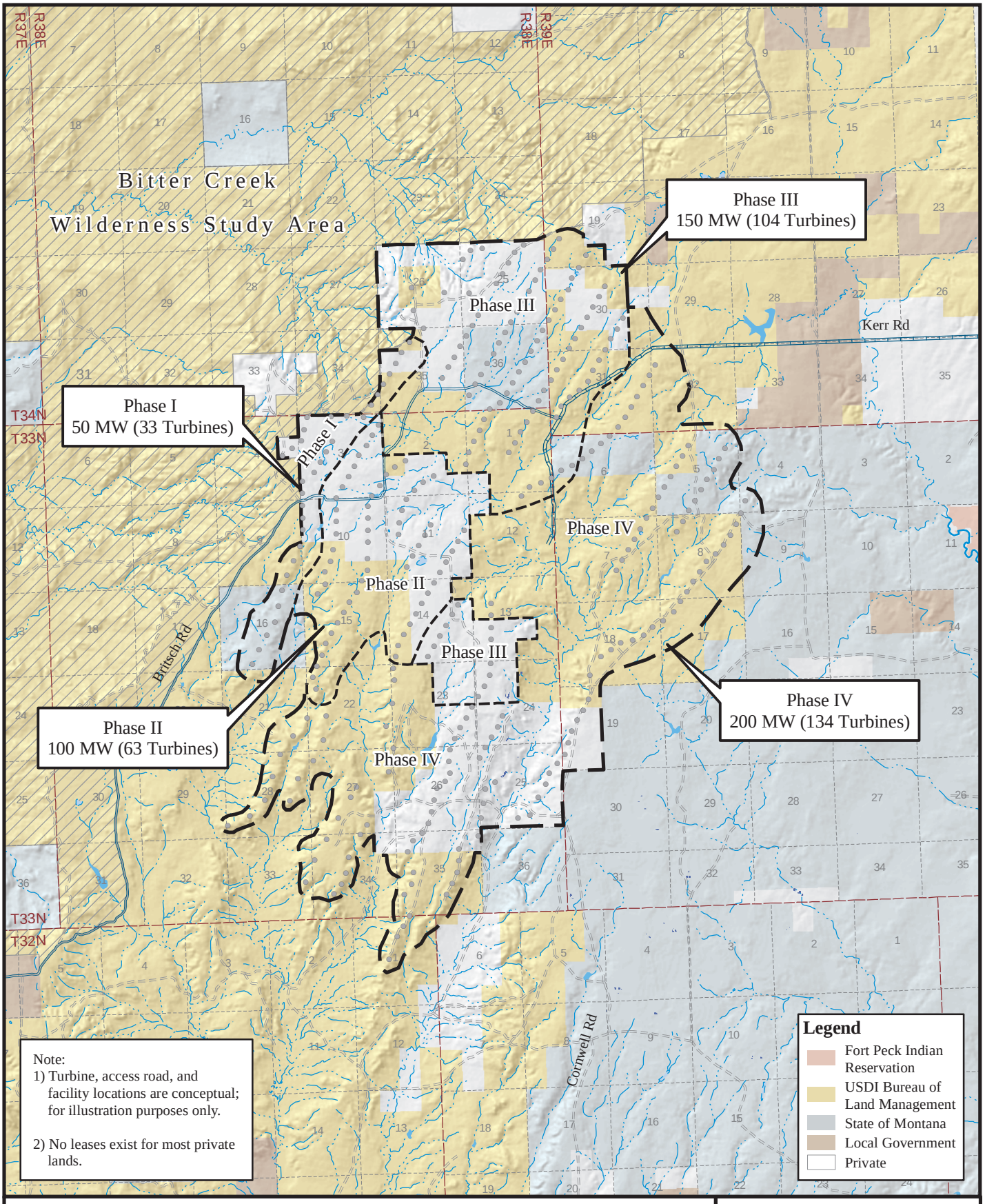

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Figure 2.3-1
Wind Farm Phases

VALLEY COUNTY WIND ENERGY PROJECT

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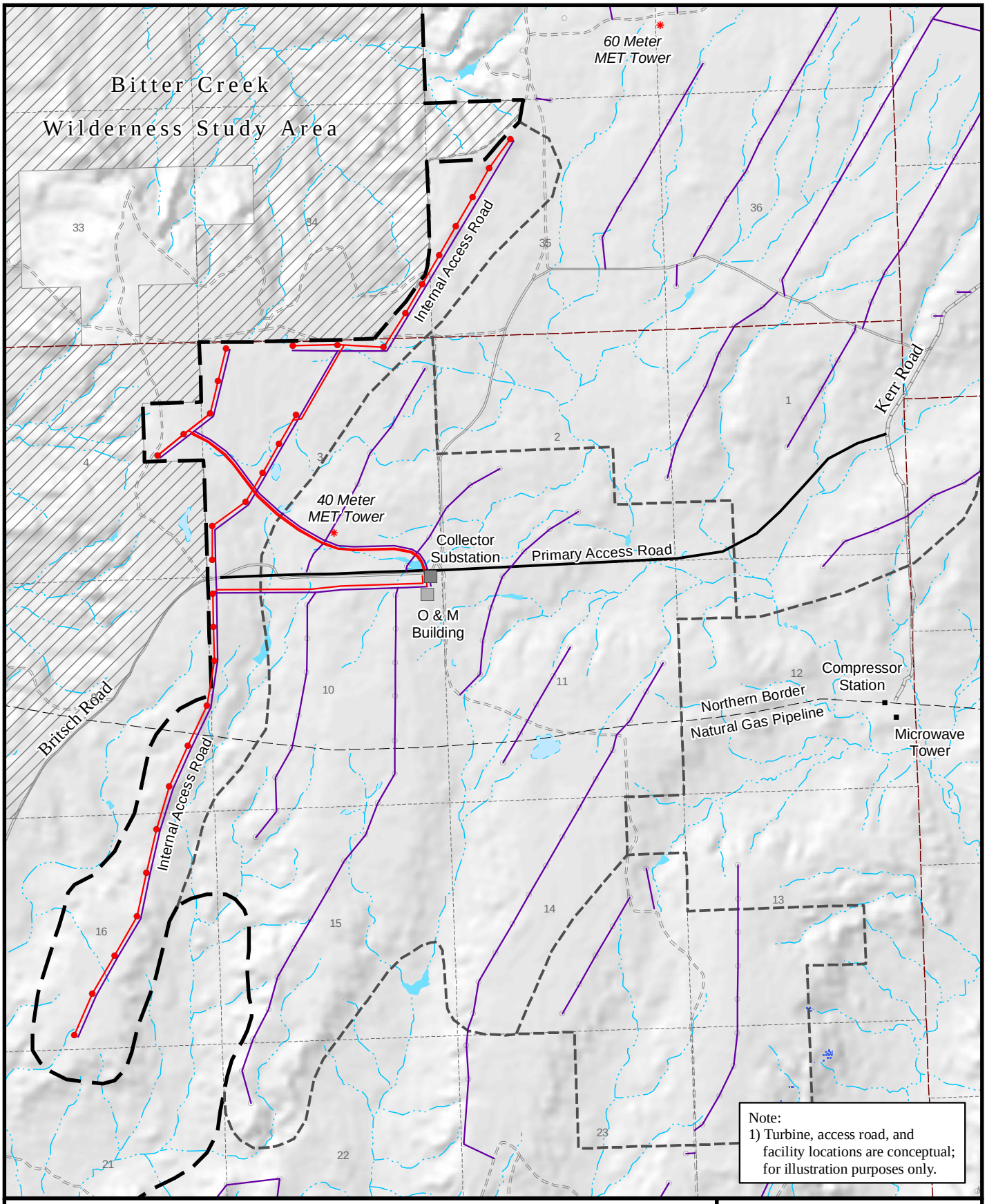

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Figure 2.3-2
Phase I
Preliminary
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VALLEY COUNTY WIND
ENERGY PROJECT

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The proposed wind farm would contain wind turbine generators, an underground electrical collector system, a collector substation, a primary access road, an internal road network, and an O&M building. These facilities, as well as existing meteorological (MET) towers, are described below.

Wind Turbines

Wind Hunter would install and operate three-bladed 1.5MW wind turbines up to 390 feet high. The final selection of the exact make and model of wind turbine to be used for the project would depend on technological changes, finances, equipment availability, and other factors.

Wind turbines consist of three main components: the turbine tower, nacelle (machine house) and rotor blades. Figure 2.3-3 illustrates a typical modern three-blade upwind turbine generator and dimensions. The 1.5MW wind turbine under consideration for the project has design features summarized in Table 2.3-2.

Towers would be 215 to 260 feet tall at the turbine hub (referred to as the "hub height"). With the nacelle and blades mounted, the total height of the wind turbine with a blade in the vertical position ("tip height") would be 330 to 390 feet. The tower would be a tubular conical steel structure approximately 14 feet in diameter at the base. The towers would be painted neutral gray to be visually less obtrusive. An interior service platform at the top of each section would allow access to each towers' connecting bolts for routine inspection. A ladder inside the structure would provide access to the nacelle for turbine maintenance. There would be interior lighting and a safety cable next to the ladder.

The tower would be fabricated and erected in two to three sections. Each turbine tower section would be transported to the site on trailers that can carry one tower section each. Typically, the transport company would develop a transportation plan based on specific object sizes, weights, origin, destination, and unique handling requirements. Tower sections would be delivered to a staging area and then to each tower location. They would be erected using a large construction crane.

The nacelle is the portion of the wind turbine mounted at the top of the tower. The nacelle houses the main mechanical components of the wind turbine generator—the drive train, gearbox, and generator. The nacelle would also be equipped with an anemometer and wind vane that signal wind speed and direction to an electronic controller. Electric motors would rotate (yaw) the nacelle and rotor to keep the turbine pointed into the wind to maximize energy capture. An enclosed, steel-reinforced fiberglass shell would house the nacelle to protect internal machinery from the elements and to dampen noise. Some of the nacelles would be equipped with aviation warning lights meeting Federal Aviation Administration (FAA) aircraft safety requirements. These lighting requirements will be determined during final design after consulting with the FAA.

Modern wind turbines have three-bladed rotors. Each blade would be 100 to 115 feet long; the diameter of the circle swept by the blades would range from 200 to 230 feet. The blades would turn 10 to 23 revolutions per minute (RPM). Generally, larger wind turbine generators have slower rotating blades, but the specific RPM values depend on aerodynamic design and vary across machines. Rotor blades are typically made from glass-reinforced polyester composite.

Figure 2.3-3 Typical 1.5MW Wind Turbine Dimensions

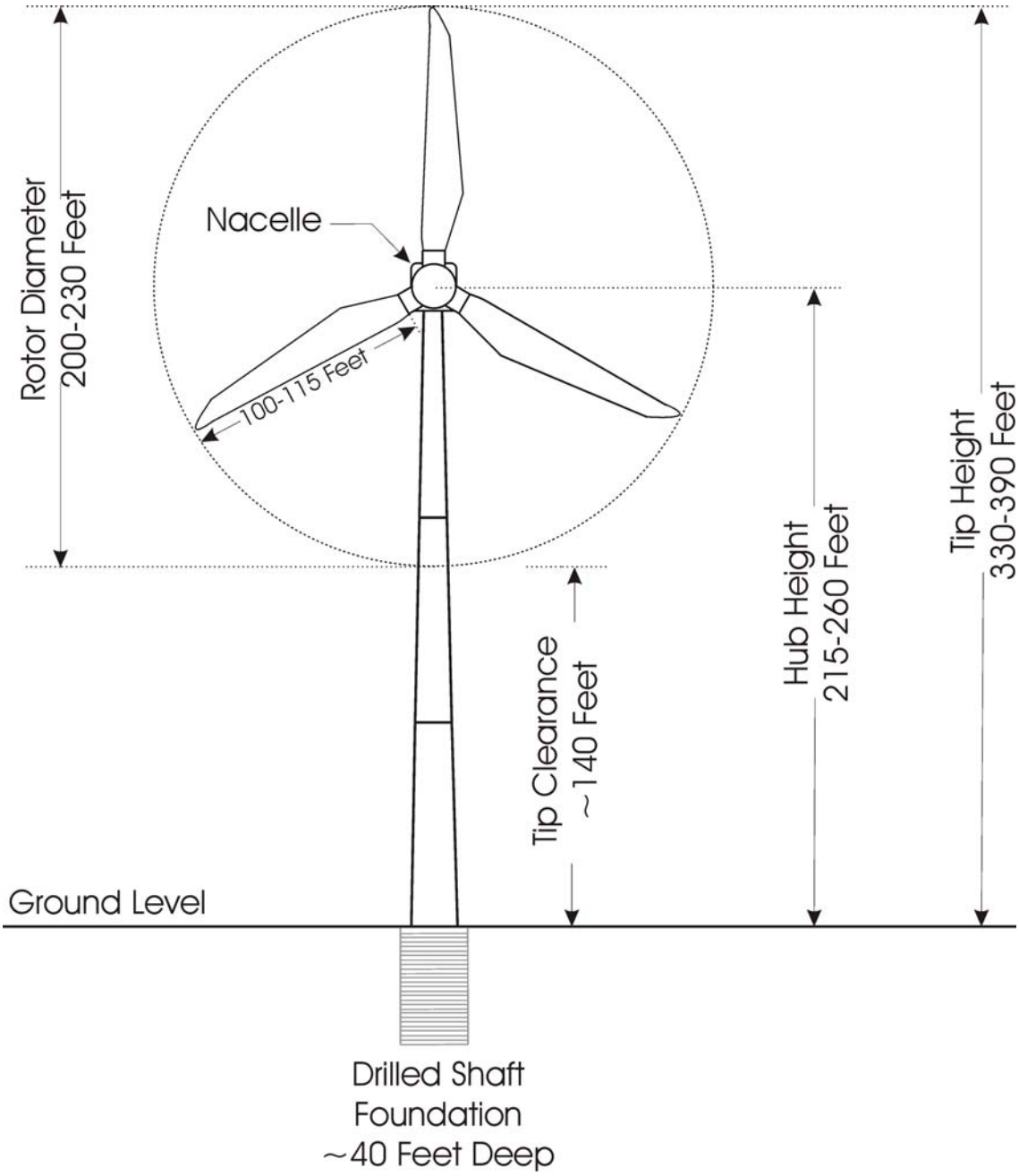


Table 2.3-2 Wind Turbine Features

Design Feature	Description
Turbine technology type	Three-Bladed Upwind Wind Turbine[1]
Rated output of turbine	1.5MW
Axis	Horizontal
Rotor orientation	Upwind
Cut-in wind speed (Minimum wind speed for turbines to begin operating)	7 to 10 mph[2]
Cut-out wind speed (Maximum wind speed before turbines stop operating)	56 mph
Rotational speed	10 to 23 RPM[3]
Number of blades	3
Rotor (blade) diameter	200 to 230 feet
Tower type	Tubular steel
Tower diameter at base	14 feet
Foundation diameter[4]	Approximately 14 feet
Foundation depth[4]	At least 40 feet
Tower hub height (nacelle)	215 to 260 feet
Tower tip height (to top of vertical rotor)	330 to 390 feet
Nacelle	Fully enclosed steel or steel-reinforced fiberglass
Color	Neutral gray

[1]Data for a GE 1.5MW wind turbine used as an example. Actual turbine manufacturer not yet determined.
[2]Wind turbines rotate in winds as low as 2 to 3 mph, but generator cut-in occurs at 7 to 10 mph.
[3]Revolutions per minute
[4]Foundation diameter and depth will depend on soil conditions and specific foundation shaft design. Geotechnical surveys will be performed.

Collector System

The wind farm's electrical system would have two key elements: 1) a collector system, which would collect energy from each wind turbine, increase it (i.e., step it up) to 34.5kV, and connect to the collector substation; and 2) the collector substation and interconnection facilities, which would transform the energy from 34.5kV to 161kV initially (or 230kV later phases of development) for transmission along the VCWEP 161/230kV transmission line to Western's Fort Peck-to-Havre transmission line.

The collector system would collect energy between 575 and 690 volts from each wind turbine and step it up to 34.5kV at a pad-mounted transformer adjacent to each wind turbine. Junction boxes and pad-mounted switchgear panels would be installed to connect underground 34.5kV electrical lines coming from different directions and to allow for the isolation of particular turbine strings. A turbine string is a series of turbines in a line that are connected by 34.5kV cable.

The junction boxes would be either steel clad or fiberglass panel mounted on pad foundations roughly 4 feet wide, 6 feet long and 6 feet high. The pad foundation would have an underground vault about 3 feet

deep where the underground cables come in. The junction boxes would also have a buried grounding ring with grounding rods tied to the collection system and a common neutral.

The switch panels would be steel-clad enclosures mounted on pad foundations roughly 7 feet wide, 7 feet long and 5 feet high. Switches would allow particular collector lines and turbine strings to be turned off or isolated. This isolation would allow maintenance and repair to take place without shutting down the wind farm. The pad foundation would have an underground vault about 3 feet deep where the underground cables come in. Switch panels would also have a buried grounding ring with grounding rods tied to the collection system and a common neutral.

Collector Substation

The collector substation would transform the electricity from 34.5kV to 161kV for transmission along the proposed 230kV interconnect line to the Antelope Creek Substation. The 230kV line would be operated at 161kV because Western currently operates the Fort Peck-to-Havre transmission line at 161kV. It is anticipated that at some time in the future the Fort Peck-to-Havre transmission line may be upgraded to operate at 230kV (Western 1983), and the proposed interconnect line would be constructed similarly for such an upgrading. Features of the 161/230kV interconnection transmission line are described in more detail below.

The proposed collector substation would be located on leased private land within the wind farm. The fenced area would occupy up to 2 acres; another 1 acre would be required for a temporary work area during construction. Access to the collector substation would be provided by the new 24-foot-wide access road from Kerr Road (described below). The collector substation would require two 5 MVAR capacitor banks, 13.8kV bus and 161/230kV autotransformer, and fiber optic communications between the collector substation and the Antelope Creek Substation. The fiber optic line would be added to an overhead ground wire at the top of the towers for the proposed 161/230kV transmission line.

Operations and Maintenance Facility

One 3000-to-5000-square-foot O&M facility would be constructed at the wind farm (refer to Figure 2.3-2). It would consist of enclosed space, including offices, spare parts storage, kitchen, restrooms and a shop area. There would also be graveled outdoor parking, a turnaround area for larger vehicles, outdoor lighting and gated access with either partial or full perimeter fencing. The overall area of the building and parking would be approximately 2 acres. It is estimated that there would be an additional 2 acres temporarily disturbed during construction of the facility.

New Access Road

A new gravel road to access the wind farm facilities would be constructed between Kerr Road and the proposed collector substation and O&M facility at the wind farm, a distance of 2 miles (refer to Figure 2.3-2). The road would be built to the road standards and specifications of Valley County, would have a compacted gravel surface and shoulders, and would be open to the general public. The new access road would be 24 feet wide with an additional 18 feet of right-of-way on each side.

Internal Road Network

Turbines and other wind farm facilities would be accessed by vehicles and equipment using an internal network of 18-foot-wide graveled roads. Some existing roads would be improved and some new roads would be built. During construction, an additional 5 feet would be temporarily disturbed on either side of these roads to accommodate the 28-foot-wide tracks of the large construction crane used to install the turbines. It is estimated that Phase I development would require 6.6 miles of new or improved existing internal roads. It is estimated that later phases would require the following: 10.5 miles of new or improved existing internal roads during Phase II, 20.8 miles during Phase III (excluding 0.7 mile of Kerr

Road which would not require improvement), and 40.4 miles during Phase IV, for a total of 78.3 miles of new or improved existing internal roads at full build-out. Because turbine locations shown in Figures 2.3.1 and 2.3.2 are approximated and because economic and other factors will determine exact phasing and schedule, the actual length and location of roads within the internal road network may change.

The internal road network would be maintained by Wind Hunter. The roads would be inspected on an annual basis and maintained as needed.

After the project is constructed, access to the O&M facility, collector substation, and all wind turbine string roads would be controlled with lockable gates. Gates would be open during working hours and secured by project personnel after working hours. Access to public lands would not be restricted. Arrangements would be made with adjacent landowners that have legal ingress and egress across areas where project facilities would be located to ensure continued access to their property. Because the precise layout and phasing have not been determined, it is premature to decide which roads would require closure. Specific roads to be closed will be identified in the POD issued by BLM and DNRC.

At the end of each turbine string, the road would lead to a turnaround area measuring about 150 feet in diameter (0.4 acre). The turnaround areas would be used by large trucks delivering equipment. The turnaround areas would be used only during construction, so the disturbance would be temporary.

Meteorological Towers

Wind Hunter currently has three MET towers in the wind farm area that are moved periodically to further measure the wind. The towers are described in Table 2.3-3, and their locations are shown on Figure 2.3-2.

MET towers are used to measure wind conditions, including speed, direction and temperature, and would be used to confirm turbine performance. Each tower consists of a guyed tubular structure supported by a metal plate or other temporary footing that typically rests on the ground surface. The towers are supported by three to four sets of guy wires that extend 100 to 200 feet from the base of each tower. Existing roads and overland access are used to access the towers. Only MET towers taller than 200 feet (61 meters) require lighting in compliance with FAA aircraft safety requirements.

Table 2.3-3 Meteorological Towers in the VCWEP Area

MET Tower Number	Height (meters)	Location	Installation	Removal
951	40	Private	April 26, 2004	--
952	60	Private	September 10, 2004	--
953	60	Private	March 2004	August 2005
954	60	BLM	August 31, 2005	--

Wind has been measured in three separate locations on private land. Wind has been measured on public lands since August 2005, as authorized by BLM Right-of-Way Grant MTM-93841, issued in August 2005 under the Federal Land Policy and Management Act (FLPMA). The BLM prepared a Categorical Exclusion prior to authorization. Following evaluation of data collected at these locations, the MET towers will be dismantled or moved to another location.

Temporary and Permanent Ground Disturbance

Table 2.3-4 summarizes the amount of temporary and permanent ground disturbance that is expected to occur as a result of the construction of Phases I, II, III, and IV of the wind farm. The assumptions used in calculating ground disturbance are presented below:

- O&M Facility. This facility would cause up to 5000 square feet on a 2-acre site (parking and storage) to be permanently disturbed. An additional 2-acre work area would be temporarily disturbed.
- Collector Substation. This facility would be on a 2-acre fenced site (permanent disturbance). There would also be a 1-acre temporarily disturbed work area.
- Collector System. This system would consist of underground 37.5kV lines in 5-foot wide trenches within 12-foot-wide corridors. All disturbance would be temporary. The corridors would be adjacent to the internal road network and portions of Kerr Road. It is assumed that 3.5 feet of each corridor would overlap with temporarily disturbed land next to all roadways except Kerr Road. There would be an estimated 6.8 acres of temporary disturbance in Phase I, 10.8 acres in Phase II, 22.4 acres in Phase III, and 41.6 acres in Phase IV, for a total of 81.6 acres.
- New Access Road. The new access road would be 2 miles long and 24 feet wide (5.8 acres of permanent disturbance). There would be an additional 18 feet on each side for right-of-way (8.7 acres of temporary disturbance).
- Internal Road Network. The internal road network at the wind farm would include both new and improved existing unpaved roads. These roads would be 18 feet wide (permanent disturbance) with an additional 5 feet on each side to accommodate the construction crane (temporary disturbance). No improvements would be needed along Kerr Road. Estimated distances of new and improved roads are: for Phase I (6.6 miles); Phase II (10.5 miles); Phase III (20.8 miles, excluding 0.7 mile of Kerr Road which would not require improvement); and Phase IV (40.4 miles). It is estimated new or improved existing internal roads during Phase I would cause 14.4 acres of permanent disturbance and 8.0 acres of temporary disturbance. It is estimated that later phases would require 22.9 acres of permanent disturbance and 12.7 acres temporary disturbance for Phase II; 45.4 miles of permanent disturbance and 25.2 acres of temporary disturbance for Phase III; and 88.1 acres or permanent disturbance and 49.0 acres of temporary disturbance for Phase IV. At full build-out there would be a total of 170.8 acres of permanent disturbance and 94.9 acres of temporary disturbance due to new or improved existing internal roads. Because turbine locations shown in Figures 2.3.1 and 2.3.2 are approximated, the amount of disturbance caused by construction of the internal road network may change.
- Turbine String Turnaround Areas. At the end of each turbine string, a 150-foot-diameter (0.4-acre) turnaround area (temporary disturbance) would be need for large trucks and trailers. There would be an estimated 2 turnaround areas for Phase I, 13 for Phase II, 11 for Phase III, and 29 for Phase IV. It is estimated that turnaround areas would total 0.8 acre of temporary disturbance in Phase I, 5.2 acres in Phase II, 4.4 acres in Phase III, and 11.6 acres in Phase IV, for a total of 22.0 acres of temporary disturbance at full build-out.
- Geotechnical investigations have not been performed. However, it is assumed that turbines would use monopole foundations, not spread footings. Foundations would be drilled shafts 14 feet in diameter (154 square feet) (permanent disturbance). There would be an estimated 0.1 acre of permanent disturbance in Phase I, 0.2 acre in Phase II, 0.3 acre in Phase III, and 0.4 acre in Phase IV, for a total of 1.0 acre at full build-out.
- Pad-Mounted Transformers. Transformers would permanently disturb 50 to 120 square feet per turbine. There would be an estimated 0.1 acre of permanent disturbance in Phase I, 0.2 acre in

Table 2.3-4 Temporary and Permanent Ground Disturbance (Acres) by Wind Farm Phase

	Phase I			Phase II			Phase III			Phase IV			Full Build-out		
Number of Turbines	33			63			104			134			334		
Acres	1,094			2,800			5,520			10,706			20,120		
Power Generated (MW)	50			100			150			200			500		
	Temp.	**Perm.**	**Subtotal**	**Temp.**	**Perm.**	**Subtotal**	**Temp.**	**Perm.**	**Subtotal**	**Temp.**	**Perm.**	**Subtotal**	**Temp.**	**Perm.**	**Subtotal**
O&M Building	2.0	2.0	***4.0***	0	0	***0***	0	0	***0***	0	0	***0***	2.0	2.0	***4.0***
Collector Substation	1.0	2.0	***3.0***	0	0	***0***	0	0	***0***	0	0	***0***	1.0	2.0	***3.0***
Collector System	6.8	0	***6.8***	10.8	0	***10.8***	22.4	0	***22.4***	41.6	0	***41.6***	81.6	0	***81.6***
New Access Road	8.7	5.8	***14.5***	0	0	***0***	0	0	***0***	0	0	***0***	8.7	5.8	***14.5***
Internal Road Network	8.0	14.4	***22.4***	12.7	22.9	***35.6***	25.2	45.4	***70.6***	49.0	88.1	***137.1***	94.9	170.8	***265.7***
Turbine String Turnaround Areas	0.8	0	***0.8***	5.2	0	***5.2***	4.4	0	***4.4***	11.6	0	***11.6***	22.0	0	***22.0***
Wind Turbine Foundations	0	0.1	***0.1***	0	0.2	***0.2***	0	0.3	***0.3***	0	0.4	***0.4***	0	1.0	***1.0***
Pad-Mounted Transformers	0	0.1	***0.1***	0	0.2	***0.2***	0	0.3	***0.3***	0	0.4	***0.4***	0	1.0	***0.9***
Turbine Work Areas/Material Staging	33.0	0	***33.0***	63.0	0	***63.0***	104.0	0	***104.0***	134.0	0	***134.0***	334.0	0	***334.0***
TOTAL	60.3	24.4	***84.7***	91.7	23.3	***115.0***	156.0	46.0	***202.0***	236.2	88.9	***325.1***	544.2	182.5	***726.7***

Note: Assumptions made in calculating temporary or permanent ground disturbance are discussed in Section 2.3.2. Some rounding error may affect subtotals and totals.

Phase II, 0.3 acre in Phase III, and 0.4 acre or less in Phase IV, for a total of less than 1.0 acre at full build-out.

- Turbine Work Areas/Material Staging. These areas would include the crane pad and rotor assembly area at each turbine. There would be a 115-to-130-foot-radius area (about 1.0 acre) of temporary disturbance per turbine. (33.0 acres of temporary disturbance in Phase I, 63.0 acres in Phase II, 104.0 acres in Phase III, and 134.0 acres or less in Phase IV, for a total of 334 acres at full build-out).

Safety Features and Control Systems

Safety features and control systems at the wind farm would include: 1) remote control systems located at the O&M facility that would constantly monitor each turbine for wind speed and direction, air and machine temperatures, electrical voltages, currents, vibrations, blade pitch and yaw; 2) two full independent braking systems on each turbine; 3) an internal fire detection system on each turbine; 4) a lightning protection system on each turbine; 5) lights that flash white during the day and red at night, as required by the FAA; and 6) nighttime and motion sensor lights at the collector substation and O&M facility.

Cost of Construction

Capital cost of construction for each phase of wind farm development is estimated in Table 2.3-5. Estimated construction costs include the capital and labor construction costs for a 1.5MW, 60Hz wind turbine generation system. GE Wind Energy, a subsidiary of GE Power Systems, provided the capital construction cost estimate (GE Wind Energy 2004). Labor costs were first estimated at 40 to 45 percent of capital costs and then refined based on contractor estimates obtained by POWER Engineers. Capital and labor cost items included in the cost estimate for each phase of the wind farm (Table 2.3-5) consist of the turbines, towers, and blades; shipping; spare parts; civil costs; mechanical/erection; electrical distribution; engineering; O&M facility; and five-year warranty. Wind farm cost items exclude the collector substation, Antelope Creek Substation, and transmission line, all of which would have to be constructed before Phase I could begin operation.

Table 2.3-5 Estimated Construction Costs of Wind Farm

Phase	Capital Cost (in millions)	Labor Cost (in millions)	Total Cost (in millions)
Phase I 33 turbines, 50MW[1]	$ 37.2M	$ 16.4M	$ 53.6M
Phase II 63 turbines, 100MW	$ 71.1M	$ 32.2M	$ 103.3M
Phase III 104 turbines, 150MW	$ 112.2M	$ 48.7M	$ 160.9M
Phase IV 134 turbines, 200MW	$ 140.5M	$ 62.8M	$ 203.3M
Total 334 turbines, 500MW	$ 361.0M	$ 160.1M	$ 521.1M

Source: GE Wind Energy 2004; contractor estimates obtained in 2004

[1]Costs for Phase I exclude the 161/230kV transmission line, Antelope Creek Substation, and collector substation, all of which would be built during Phase I.

Interconnection Substation

Two types of substations would be required for the project: a collector substation at the wind farm and an interconnection substation for the Fort Peck-to-Havre transmission line (Antelope Creek Substation). The collector substation is described above.

Antelope Creek Substation

A new substation at Antelope Creek, located 7 miles west of Glasgow and south of the Milk River, would provide the interconnection between the proposed wind farm and the Fort Peck-to-Havre 161kV transmission line. The substation would be designed, constructed and operated by Western. Interconnection to the Western transmission system requires an interconnection agreement. A TSA is required for the delivery component of the project and has already been signed by the requestor (Wind Hunter). A second transmission service request has been submitted by Wind Hunter that will incorporate up to an additional 350MW installed under Phases II and III, and will be subject to Western's Large Generator Interconnection Procedures and Large Generator Interconnection Agreement. No interconnection or transmission service request has been received to date by Western for Phase IV (200MW).

Western has concluded in a System Impact Study and Facilities Study that a five-breaker 230kV main and transfer bus substation would be required to provide a reliable interconnection for the wind farm. New equipment in the substation would include 230kV bus work; circuit breakers; power transformer; reactive compensation; related substation equipment; control building; requisite control; protection and communication equipment; and transmission line approach spans and structures.

Additional phases of construction would require new or modified System Impact and Facilities Studies by Western and new TSAs with Western.

The interconnection line from the wind farm would interconnect to the proposed Antelope Creek Substation at 161kV. The new substation would include a three-phase autotransformer with a convertible 230-161kV winding on the high side, a 69kV low voltage winding, and 13.8kV tertiary. The transformer would provide a low-voltage alternative for the required voltage support and a source of station power. It was determined by Western through cost analysis that the addition of the power transformer would have cost benefits by providing capacitance and reactance to the overall power system. Additional shunt capacitors would be required on the Fort Peck-to-Havre transmission line, possibly at the Malta Substation. Shunt reactance would also be required on the transmission system, likely at the Malta Substation. Additional reactive compensation would be required for voltage support, and either the Havre Substation or the Malta Substation would be the most likely location for this equipment. New metering equipment would also be required at the Antelope Creek Substation. It has not been determined whether the new equipment at the Malta and Havre substations would require additional land outside the current substation boundaries.

It is anticipated that at some future date, the 161kV Fort Peck-to-Havre transmission line will be upgraded to 230kV, which will require equipment changes to all affected substations on the line. These affected substations are owned and operated by NorthWestern Energy (NWE). The increased voltage level translates into an increased capacity of approximately 100MW.

The Antelope Creek Substation would initially include the interconnection line's termination structures, 80 to 100 feet in overall height, and 161kV circuit breakers. Substation high-voltage equipment would be an air-insulated type requiring electrical bus, SF6 circuit breakers, disconnecting switches, insulators and instrument transformers. Galvanized steel structures and reinforced concrete foundations would support all substation high-voltage equipment.

Sulfur hexafluoride (SF6) is a gas used to insulate circuit breakers, switches, and other electrical equipment. SF6 has been identified by the Environmental Protection Agency (EPA) as a potential greenhouse gas. Since 2000, Western has had an aggressive program to identify and repair leaks throughout the transmission system to reduce SF6 emissions.

The new substation site would require excavation, grading and other site improvements to accommodate the required equipment. Construction would be done in accordance with Western's standard environmental protection provisions (Standard 13, June 2003), which are included as Appendix G. The substation would have a fenced site area of approximately 5 acres.

Other equipment at the new substation would include a 40-foot-by-40-foot single-story control building. The surface of the substation within the fenced area would be covered with approximately 6 inches of crushed rock, and there would be gravel drive areas. The only oil-filled equipment at the substation would be the transformers, which would most likely use mineral oil. Because of the oil, a secondary containment berm would be built around the facility. A Spill Prevention and Pollution Control (SPPC) plan would be developed in accordance with applicable requirements. Substation area lighting may be provided. Restoration using native vegetation would be employed to stabilize manufactured slopes and prevent erosion.

Transmission Route C

The Proposed Action is to construct a 34.1-mile, single circuit 230kV transmission line (initially operated at 161kV) from the collector substation on the proposed wind farm to the new Antelope Creek Substation. The proposed transmission route, known as Transmission Route C, is illustrated in Figure 2.3-4. The northernmost 4.6 miles from the collector substation south (Link 1) and the southernmost 9.8 miles from the proposed Antelope Creek Substation north and east (Link 4) would be the same route as Route A.

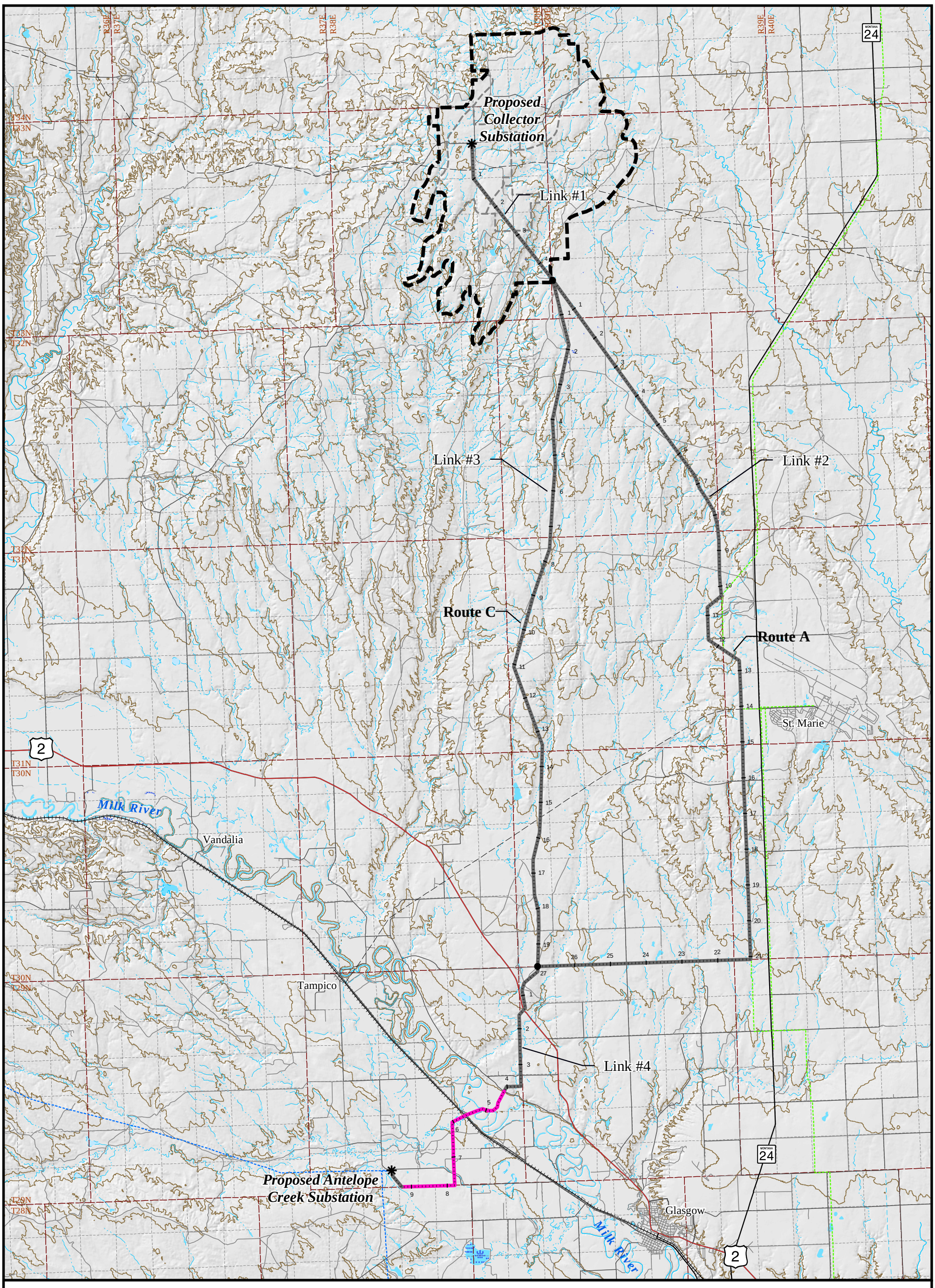
The northern 29.0 miles of the transmission interconnection, from the collector substation south, would use wood H-frame structures. The southernmost 5.1 miles to the interconnection substation (beginning at about Link 4, milepost 4.5) would use light-duty, tubular steel single poles to reduce conflicts with agricultural lands and the Milk River floodplain and to reduce visual impacts. Typical H-frame and single pole structures are illustrated in Figure 2.3-5. The line would be designed to comply with the NESC, DOL Occupational Safety and Health Standards, and recognized requirements for safety and protection of landowners and their property.

During at least Phase I of wind farm development, the transmission line would be operated at 161kV to be compatible with the operating requirements of Western's Fort Peck-to-Havre transmission line. Table 2.3-6 describes the capital, labor, and potential mitigation costs for the 161/230kV line. Information on design characteristics of the transmission line is presented in Table 2.3-7.

Table 2.3-6 Estimated Construction Costs of Transmission Route C

	Estimated Costs (in millions)
Capital Cost[1]	\$4.1M to \$4.7M
Labor Cost[1]	\$4.1M to \$4.7M
Mitigation Cost[2]	\$0.4M to \$0.5M
Total Cost	\$8.6M to \$9.9M

[1] Capital and labor costs estimated by POWER Engineers Transmission and Distribution Engineering Department (April 2006).
[2] Mitigation costs estimated at 5 percent of construction and labor costs based on mitigation costs for other linear projects



Legend

- Alternative Transmission Route
- Mile Markers
- Tenth Mile Marker
- Link Node
- H Frame Structure
- Single Pole Structure
- 500 MW Wind Project Area
- Wind Farm Phase Divider
- US Highway
- State Highway
- Paved Arterial Road
- Gravel or Graded Arterial Road
- Local or Minor Road
- Railroad
- 230kV Transmission Line Energized at 161kV
- Other Transmission Line
- Pipeline
- Township Line
- Section Line
- Index Contour (100' Interval)
- River or Stream
- Intermittent Stream
- Canal
- Lake or Pond
- Intermittent Pond
- Swamp or Marsh
- Proposed Substation

VALLEY COUNTY WIND ENERGY PROJECT

Figure 2.3-4

Transmission Routes A and C

0 0.5 1 2 3 4 5 6

Miles

1:158,400 or 1" = 2.5 Miles

POWER ENGINEERS

WIND HUNTER

Print Date : March 2, 2006

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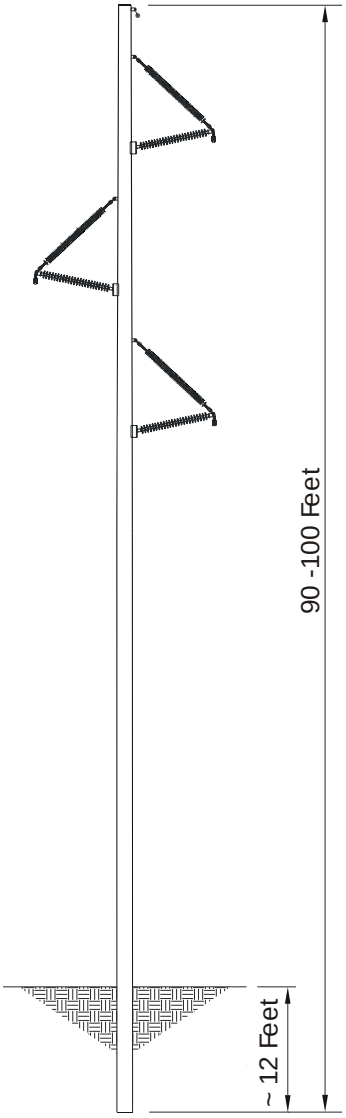
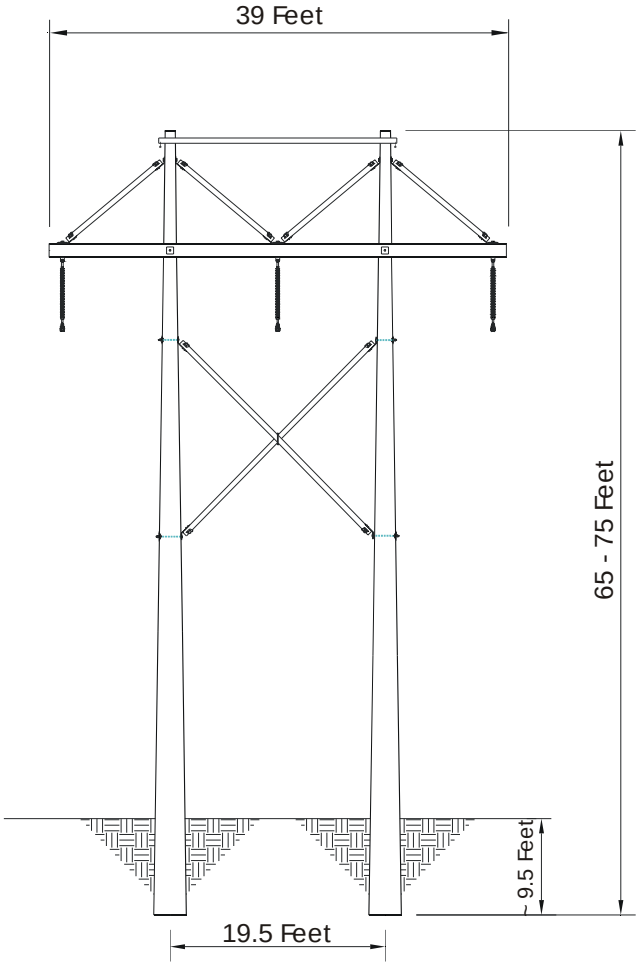
Figure 2.3-5 Typical Single Pole and H-Frame 230kV Transmission Line Structures



Typical 230kV Light Duty Steel Pole Configuration



Typical 230kV Wood H-Frame Configuration

Construction of the transmission line would proceed simultaneously with Phase I of wind farm development. The expected life of the transmission line is 30 to 50 years.

Portions of the proposed transmission line and access roads would cross public land managed by the BLM. A right-of-way application was submitted to the BLM in July 2004 that requested a Grant of Right-of-Way for 30 years. In order for the proposed transmission line and access roads to cross Montana School Trust Lands, an easement would need to be secured from DNRC. Easements to cross private lands would be negotiated with individual landowners. If rights-of-way on private land are no longer needed after decommissioning, these easements would be relinquished.

Where H-frame structures are used, right-of-way width is expected to be 110 feet. Structure height would be 65 to 75 feet, and the average span would be approximately 850 feet. Adjacent to agricultural lands and through the Milk River Valley, the line would be constructed on tubular steel poles 90 to 100 feet high. The tubular steel poles would be finished with a rusty-brown colored corten surface, a finish that that forms a patina-color permanent surface. Single pole construction would continue from this location (Link 4, milepost 4.5) to the new Antelope Creek Substation. Right-of-way width to accommodate the line in this area is expected to be 80 feet, but may be wider in some locations depending on engineering requirements. The average span in this portion of the line route would be approximately 700 feet.

Insulators for the transmission line would be hung from each structure or pole. Each string would have 12 to 13 insulators. Insulators and hardware used on the line would be standard design, should provide nearly corona-free operation, and would reduce audible noise and interference with radio transmission.

Two overhead ground-wires would be installed at the top of the structures and poles to provide protection from direct lightning strikes. A fiber optic line would be installed in one of the overhead ground-wires for communication between the O&M building at the wind farm and the Antelope Creek Substation. Communications systems would observe industry standards.

Access Roads

Access roads would be used during construction and periodic maintenance of the transmission line. Existing roads and trails would be used wherever feasible. Some access roads would be located within the right-of-way, but portions would need to be outside the right-of-way. Access roads would be revegetated following construction, but the road prisms would remain intact for access during routine patrols and maintenance. For much of Transmission Route C, Cornwell Road would provide construction access. Cornwell Road would remain open following construction activities.

Temporary and Permanent Ground Disturbance

Anticipated temporary and permanent ground disturbance for Transmission Route C is summarized in Table 2.3-8. Outside the permanent disturbance areas, work areas along the transmission line would be cleared of vegetation only to the extent necessary to allow equipment to maneuver. Grading would occur only where the topography is too steep or uneven to allow safe equipment operation. It is anticipated that areas requiring grading would be avoided during project design wherever practical. After line construction, all work areas would be restored to approximate original contours and revegetated using native species. Transmission Route C would have 70.8 acres of permanent disturbance and 75.6 acres of temporary disturbance.

Table 2.3-7 Design Characteristics of 230kV Transmission Line

	Structure Type	
Feature	**Wood Pole, H-Frame**	**Light Duty Steel, Single Pole**
Structure Height	65 to 75 feet	90 to 100 feet
Typical Span Length	850 feet	700 feet
Number of Structures per Mile	6 to 7	7 to 8
Estimated Cost Per Mile	$237,000 - $271,000	$274,000 - $313,000
Right-of-Way Width	110 feet	80 feet
Structure Work Areas	2-Pole Tangent: 75 feet by 100 feet (7,500 square feet) 3-Pole Dead End: 200 feet by 200 feet (40,000 square feet)	50 feet by 150 feet (7,500 square feet
Structure Base Dimension	4 feet by 25 feet (100 square feet)	3 feet by 3 feet (9 square feet)
Permanent Ground Disturbance per Structure	6 square feet	4 square feet
Material Laydown, Storage Yard	5 to 10 acres per site. One site for entire transmission line.	5 to 10 acres per site. One site for entire transmission line.
Pulling/Tensioning Sites	100 feet by 300 feet (0.7 acre). One site for approximately every 2 miles.	100 feet by 300 feet (0.7 acre). One site for approximately every 2 miles.
Access Road Width	14 feet	14 feet
Voltage	230kV (initially operated at 161kV)	230kV (initially operated at 161kV)
Capacity: 161kV Operation 230kV Operation	 320MW 460MW+	 320MW 460MW+
Circuit Configuration	Single circuit, single conductor per phase (3 phases), horizontal configuration	Single circuit, single conductor per phase (3 phases), vertical configuration
Conductor Size	1272 kcmil ACSR “Bittern” (1.35 inches)	1272 kcmil ACSR “Bittern” (1.35 inches)
Maximum Anticipated Electrical Field at Edge of Right-of-Way	0.8kV/m	0.9kV/m
Maximum Anticipated Electrical Field within Right-of-Way	3kV/m	3kV/m
Maximum Anticipated Magnetic Field at Edge of Right-of-Way	500MW (1,255 Amps): 65 mG	500MW (1,255 Amps): 57 mG
Maximum Anticipated Magnetic Field within Right-of-Way	500MW (1,255 Amps): 306 mG	500MW (1,255 Amps): 188 mG
Minimum Ground Clearance of Conductor	26 feet	26 feet

Table 2.3-8 Temporary and Permanent Ground Disturbance for Transmission Route C

Transmission Line Feature	Estimated Number	Temporary Ground Disturbance		Permanent Ground Disturbance	
		Sq. Ft.	Acres	Sq. Ft	Acres
Structures/Work Areas					
H-Frame (Tangent)[1]	187	1,399,350	32.1	1,119	0.03
H-Frame (Dead End)[2]	16	640,000	14.7	96	<0.01
Single Pole (Tangent)[1]	35	261,600	6.0	140	<0.01
Single Pole (Dead End)[2]	6	45,000	1.0	24	<0.01
Material Laydown/Storage Yard[3]	1	435,600	10.0		
Pulling Tensioning Sites	17	510,000	11.7		
Access Roads				3,083,177	70.8
Total		3,291,550	75.6	3,084,556	70.8

[1]Tangent structures are transmission towers designed to support conductors along a nearly straight line with only small turns or angles.
[2]Dead end structures are transmission towers that equalize stresses on the conductors because of changes in direction or unusually long spans.
[3]The specific location of the Material Laydown/Storage Yard is currently undetermined.

Construction Activities

Table 1.4-1 lists the authorizations, permits, reviews, and approvals required by Federal agencies, the State of Montana, or Valley County prior to construction of the VCWEP. Wind Hunter would not initiate any construction or other surface disturbing activities for the wind farm or transmission line until:

- Issuance of Decision Notices and determinations by BLM, Western, and DEQ related to NEPA/MEPA environmental review;
- Issuance of a Right-Of-Way Grant and approval of a POD by BLM;
- Issuance of a lease for State land within the wind farm, grant of an easement for State land within the transmission line right-of-way, and approval of a POD by DNRC;
- Receipt of a MFSA Certificate of Compliance from DEQ;
- Submission of information required by DEQ Environmental Specifications (Appendix E); and
- Receipt of other required permits and authorizations listed in Table 1.4-1.

Wind Hunter would conduct all activities associated with the construction and operation of the VCWEP in strict conformity with the conditions, stipulations and specifications contained in the BLM and DNRC POD, the BLM's Right-of-Way Grant, DEQ's Certificate of Compliance, the State of Montana lease and easement from DNRC, Western's MAP, and other required permits and authorizations. Western would not initiate any construction at Antelope Creek Substation until issuance of its determination.

Wind Farm

Construction of the wind farm would include the following main activities: 1) grading the field construction office, collector substation, and O&M facility area; 2) constructing roads, turnaround areas, staging areas, and crane pads at each wind turbine location; 3) constructing turbine tower foundations and transformer pads; 4) installing the electrical collection system; 5) constructing and installing the substation; 6) transporting and assembling the wind turbines; 7) commissioning and energizing the plant; and 8) cleaning up and restoring the site.

Construction of the wind turbine foundations would require an on-site concrete batch plant during the six-to-eight-month construction period for each phase. The specific location of the batch plant has not been determined. Aggregate would be obtained from an approved off-site source and hauled to the wind farm area.

During construction of each phase of the wind farm, trucks, bulldozers, cranes, drill rigs, graders, backhoes, and other pieces of construction equipment would be required for from two to six months, although the total number of pieces of equipment present on a single day would be less. Construction would require the same types of equipment and duration for all phases, but the amount of equipment would vary depending on the number of turbines being built during a particular phase. For example, Phase III, when 104 turbines would be built, would require an estimated 167 pieces of equipment. Phase I would have 33 turbines, Phase II would have 63 turbines, and Phase IV would have 134 turbines.

Table 2.3-9 summarizes the number of workers likely to be associated with each phase of wind farm construction, operations and maintenance (refer to Section 3.5.2).

Table 2.3-9 Labor Associated with VCWEP Construction, Operations and Maintenance

	FTE[1] Workers	
Component	**Construction**	**Operations and Maintenance**
Phase I	112-131	5
Wind Farm	65-73	5
Transmission Line	36-47	0[2]
Antelope Creek Substation	11	0[3]
Phase II (Wind Farm only)	140-147	8[4]
Phase III (Wind Farm only)	248-253	12[4]
Phase IV (Wind Farm only)	267-272	16[4]

[1]FTE= Full-time Equivalent (includes both full and part-time workers)
[2]Operations personnel would be at a remote location or at the O&M facility on the wind farm.
[3]Operations would be performed remotely from Western's operations facilities. Maintenance would be performed by staff at Western's Montana maintenance office in Fort Peck.
[4]Including operations and maintenance FTE workers from previous phase.

Transmission Line

Construction of the transmission line would require the following steps: 1) centerline surveyed and staked; 2) access roads built as needed; 3) work areas cleared as needed; 4) drilled pier foundations installed; 5) towers erected and installed; 6) fiber optic and traditional ground wire, conductors, and ground rods installed at points of intersection and other locations, as appropriate; and 7) site cleaned up and reclaimed. Figures 2.3-6 and 2.3-7 illustrate the sequence of construction activities for a typical transmission line.

Figure 2.3-6 Typical Transmission Line Construction Activities

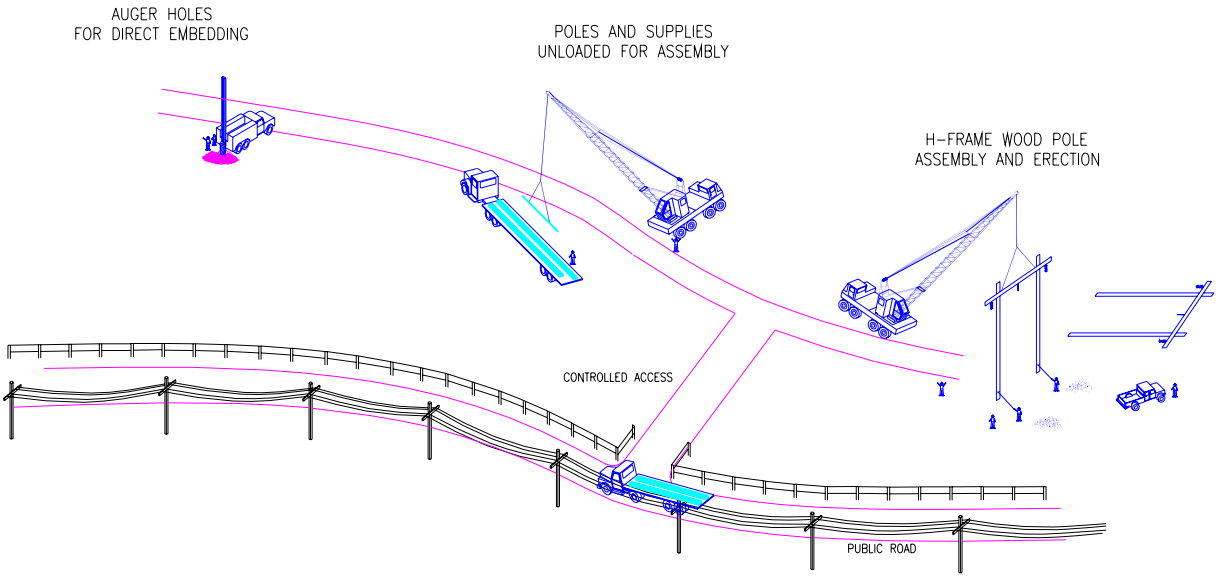
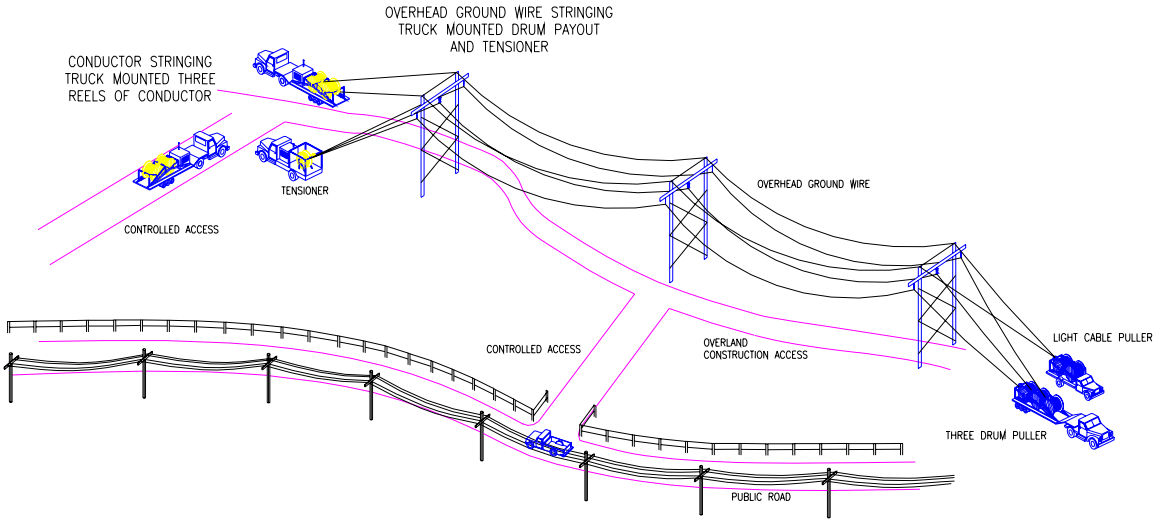


Figure 2.3-7 Typical Tensioning and Pulling Activities



Construction of a 230kV transmission line would require 43 pieces of construction equipment for between six and eight months. These would include cranes, trucks, graders, bulldozer, tractors, drum pullers, and other equipment. Construction of the transmission line would require 36 to 47 workers (Table 2.3-9).

Antelope Creek Substation

Initial construction of the Antelope Creek Substation would include grubbing vegetation and grading a pad and two short access roadways. Grading would provide for adequate drainage and erosion control, and secondary containment berms would be built to contain a transformer oil spill. Overall, very little cut and fill would be required to accommodate substation development on this flat site. The grading plan could require installation of drainage ditches outside the fenced area to redirect runoff from the substation. Western's environmental protection standards would be enforced during construction of the Antelope Creek Substation. Appendix G contains Western's standard provisions (Standard 13, June 2003).

Required equipment would include rippers, scrapers, rock drills, loaders, backhoes, drill rigs, and trucks. Reinforced concrete foundations would be installed to support the electrical equipment and control facilities. Trenches would be dug for copper conductors for the station-grounding mat. After the grounding mat is in place, porcelain insulators, circuit breakers, disconnect switches, coupling capacitor voltage transformers, power circuit breakers, and power transformers would be installed.

The active construction schedule at the substation would run for approximately four to six months, from the start of the site work to final installation of the electrical equipment. The Antelope Creek Substation and the collector substation on the wind farm would both have to be completed before VCWEP operations would begin, but the two facilities would not need to be built simultaneously.

Operations and Maintenance

General project operations of the wind farm would require between 5 and 16 onsite staff, depending on the phase (see Table 2.3-9), consisting of managers and operating technicians. The day-to-day operation of the transmission line would be directed by system dispatchers in the power control center in the O&M facility interacting with Western staff at remote locations.

For a wind farm, a typical operating plan includes a planned outage schedule that consists of wind turbine inspections and maintenance after the first three months of operation, a break-in diagnostic inspection, and subsequent services every six months. The six-month servicing would generally take a wind turbine off-line for one day. Although most wind farms operate 65 to 90 percent of the time, they typically run at less than full capacity. Unscheduled maintenance and forced outages are not predictable, but after a wind turbine is properly tuned, unplanned outages are rare and downtime is usually limited to the routine service schedule.

An Emergency Response Plan would be established for the project to ensure employee safety during emergencies.

The plant operations group would prepare a detailed security plan to protect the project and personnel. Assess to the O&M facility and wind turbine string roads would be controlled by lockable gates, although access to public land would not be restricted.

When the transmission line has been energized, land uses that are compatible with safety regulations, such as agriculture and grazing, would generally be permitted in and adjacent to the right-of-way. Incompatible land uses within transmission line rights-of-way include construction and use of inhabited dwellings, any use requiring changes in surface elevation that would affect existing or planned facilities,

and burning underneath the lines. Land uses that comply with Valley County regulations would be permitted adjacent to the right-of-way (see Table 1.4-1). Compatible uses of the right-of-way on Federal lands would have to be approved by BLM. A DNRC right-of-way easement is for specific use and does not restrict other uses from taking place; exclusive easements are rarely issued by DNRC for transmission lines. Therefore, the activities allowed to take place within the right-of-way on State lands will be determined by DNRC. The right-of-way through private lands could be used for roads, agriculture, and other purposes consistent with the easements.

The transmission line would be inspected on a regular basis by both ground and air patrols. The standard inspection schedule is twice per year. Maintenance would be performed as needed. Transmission lines damaged by storms, floods or accidents require immediate repair.

Substation monitoring and control functions would be performed remotely from Western's operations facilities. Maintenance activities include equipment testing, equipment monitoring and repair, and emergency and routine procedures for service continuity and preventive maintenance. Routine operations would require weekly visits to the substation; a major maintenance inspection would take place approximately once a year. Access to Antelope Creek Substation would be controlled by fences, locked gates, and warning signs.

Decommissioning and Abandonment

At the end of the useful life of the proposed project, if the wind farm and transmission line were no longer required, they would be abandoned under the terms of the Right-of-Way agreement with BLM, the lease and easement with DNRC, and other easement agreements.

The design life of turbines, transformers, substations and supporting infrastructure is at least 20 years. It is likely that after mechanical wear takes its toll, the project could be upgraded with more efficient equipment to have a useful life longer than 20 years.

As mentioned in the Wind Energy Development PEIS (BLM 2005), site decommissioning typically would involve the reverse of site development. Turbine towers would be dismantled and either recycled, sold for scrap, or disposed of off site as solid waste. Concrete would be broken up to be recycled or disposed of as solid waste. Electronic equipment would be recycled or disposed of as either solid waste or, in some cases, as hazardous waste. Turbine foundations and below-ground cables are expected to be left in place, although foundations may be removed to a depth of 3 feet to accommodate revegetation. Disturbed land (e.g., access roads) would be restored to the original contour and reseeded or replanted.

The expected life of a transmission line is 30 to 50 years. Prior to abandonment, structures, conductors, insulators and hardware would be dismantled and removed from the right-of-way in accordance with conditions of the DEQ Certificate of Compliance, the BLM Right-of-Way Grant, and easement with DNRC. Wood pole structures would be cut off below the ground surface or removed entirely. Single steel poles would be completely removed. Following abandonment and removal of the transmission line from the right-of-way, temporarily disturbed areas would be restored as nearly as possible to their original condition.

2.3.3 Alternative A

Wind Farm and Antelope Creek Substation

Under this alternative, the proposed wind farm and new Antelope Creek Substation would be the same as that described for the Proposed Action in Section 2.3.2.

Transmission Route A

The design of Transmission Route A would be similar to that of Transmission Route C in all respects except location and distance (refer to Section 2.3.2). The location of Route A is shown in Figure 2.3-4, design characteristics are summarized in Table 2.3-7, and ground disturbance information is summarized in Table 2.3-10. Transmission Route A would be 41.5 miles long.

The northernmost 4.6 miles from the collector substation south (Link 1) and the southernmost 9.8 miles from the proposed Antelope Creek Substation north and east (Link 4) would be the same as the corridor for Transmission Route C. In general, Route A roughly parallels the west side of Highway 24 and existing 69kV lines on both the east and west sides of Highway 24.

The northern 36.4 miles of this route would use H-frame structures. The southern 5.1 miles would use light-duty steel, single poles to reduce the necessary right-of-way across and adjacent to agricultural land and through the Milk River Valley. During at least Phase I of wind farm development, the transmission line would be operated at 161kV to be compatible with Western's Fort Peck-to-Havre transmission line.

Table 2.3-11 breaks out the capital, labor, and potential mitigation costs for the 161kV/230kV line along Route A.

Construction, Operations and Maintenance, and Decommissioning and Abandonment

Activities described for the Proposed Action (refer to Sections 2.3.2) would also apply to Alternative A. The only difference would be the increased length of the right-of-way for Route A, which would increase the time and labor to construct, decommission and remove the line.

Table 2.3-10 Temporary and Permanent Ground Disturbance for Transmission Route A

Transmission Line Feature	Estimated Number	Temporary Ground Disturbance		Permanent Ground Disturbance	
		Sq. Ft.	Acres	Sq. Ft	Acres
Structures/Work Areas					
H-Frame (Tangent)[1]	237	1,777,500	40.8	1,422	0.03
H-Frame (Dead End)[2]	18	720,000	16.5	108	<0.01
Single Pole (Tangent)[1]	35	261,600	6.0	140	<0.01
Single Pole (Dead End)[2]	6	45,000	1.0	24	<0.01
Material Laydown/Storage Yard[3]	1	435,600	10.0		
Pulling Tensioning Sites	21	630,000	14.5		
Access Roads				4,741,942	108.9
Total		3,869,700	88.8	4,743,600	108.9

[1]Tangent structures are transmission towers designed to support conductors along a nearly straight line with only small turns or angles.
[2]Dead end structures are transmission towers that equalize stresses on the conductors because of changes in direction or unusually long spans.
[3]The specific location of the Material Laydown/Storage Yard is currently undetermined.

Table 2.3-11 Estimated Construction Costs of Transmission Route A

	Estimated Costs (in millions)
Capital Cost[1]	$5.0M to $5.7M
Labor Cost[1]	$5.0M to $5.7M
Mitigation Cost[2]	$0.5M to $0.6M
Total Cost	$10.5M to $12.0M

[1] Capital and labor costs estimated by POWER Engineers Transmission and Distribution Engineering Department (April 2006).
[2] Mitigation costs estimated at 5 percent of construction and labor costs based on mitigation costs for other linear projects.

2.3.4 Measures to Reduce Impacts That Are Common to All Alternatives

In addition to the measures previously discussed regarding construction of the VCWEP, various measures or techniques are proposed where necessary and appropriate to avoid or minimize impacts as part of the VCWEP design (Appendix A). These measures are based on general measures identified in the Wind Energy Development PEIS (BLM 2005) and on site-specific analyses (see Chapter 3). Also, if the project is approved, DEQ is required to include a set of Environmental Specifications in its certificate decision for the proposed 161/230kV transmission line. Appendix E contains a draft set of DEQ's Environmental Specifications. Western's environmental protection standards would be enforced during construction of the Antelope Creek Substation. Appendix G contains Western's standard provisions (Standard 13, June 2003).

2.4 Comparison of Alternatives

The Proposed Action and Alternative A differ only in the transmission routes. Preferred alternative selection was based upon the comparison of Route C and Route A. The two routes were identified by the Federal and State agencies' consideration of impacts of the routing alternatives. To assist in the determination of routing preferences, the environmental consequences for each route were summarized based on the residual impacts (i.e., after mitigation measures are applied), specific environmental resource preferences, and agency and public comments.

Table 2.4-1 summarizes the impacts described in detail in Chapter 3 for the Proposed Action, Alternative A and No Action Alternative.

2.4.1 No Action Alternative

The No Action Alternative (Section 2.3.1) would eliminate impacts from the construction and operation of the wind farm and interconnection facilities. No lease benefits to landowners and residents of Valley County would occur under this alternative, and the socioeconomic benefits of temporary and permanent jobs and tax revenues would not occur in Valley County.

BLM and DNRC both support appropriate wind development on the public lands they manage. DEQ has promoted renewable energy developments. BLM's PEIS (2005) and ROD provide the land use authorization on public lands for wind energy development as proposed by the VCWEP. The No Action Alternative would be selected if it is found that the VCWEP is not an appropriate use of public lands.

2.4.2 Proposed Action

The wind energy development as described in Section 2.3.2 would be approved under this alternative. The Proposed Action was developed by the applicant (Wind Hunter) and modified in consultation with landowners, local residents, and agencies during a nearly two-year period. The Proposed Action would construct and operate the transmission interconnection line on the route designated Route C.

Both Route C (Proposed Action) and Route A (Alternative A) (see Section 2.4.3, Figure 2.3-4) would follow a common corridor beginning at the collector substation in the wind farm for the first 4.6 miles. Both routes would cross Buggy Creek near the top of the drainage (Link 4, milepost 3.8). South of this point, Route C would begin following Cornwell Road on the east side of Buggy Creek and continue south on the east side of Wolf Creek and the west side of Richardson Coulee. Route C would parallel Cornwell Road for approximately 20 miles to a point south of the intersection of Nelson Road and Highway 2 (Link 4, milepost 1.4). The route would then follow the northeast side of Highway 2 for about 0.6 mile before crossing the highway (see proposed mitigation in Section 2.5). From that point it would continue south past Riggins Road before turning west and southwest to cross the Milk River. On the opposite side of the Milk River, the route would cross the Burlington Northern Santa Fe (BNSF) tracks and Montana Secondary 246 before continuing south. The route would cross Billingsley Road nearly 2 miles east of the existing Richardson Coulee Substation, then continue west and northwest into the proposed site of the Antelope Creek Substation. For the last 9.8 miles, Routes C and A would follow the same corridor.

Route C would cause less ground disturbance because it would be parallel to Cornwell Road for over half its length (see Tables 2.3-8 and 2.3-10). It would have fewer miles than Route A of high visual impacts, although both Routes A and C would result in visual impacts to residences, highways and recreation areas. Route C would also have fewer biological resource impacts. This route parallels the existing Cornwell Road, which meets DEQ's preference under MFSA to parallel existing linear features and generally meets BLM's preferences to consolidate corridors where feasible. Route C would cross the same percentage of public land as Route A (68 percent), but because Route C is shorter, it would cross 5 fewer miles of public land than Route A.

Fragmentation of wildlife habitat in this relatively undisturbed landscape is similar for both routes. Route C would have fewer new access roads due to being parallel to the existing Cornwell Road for approximately 20 miles, so fragmentation impacts caused by ground disturbances are expected to be lower than for Route A.

2.4.3 Alternative A

The wind farm development under this alternative would use Route A for the transmission interconnection route rather than Route C (Section 2.3.2).

Route A (Section 2.3.3, Figure 2.3-4) follows the same path as Route C for the northern 4.6 miles and the southern 9.8 miles from Highway 2 to the proposed Antelope Creek Substation. Route A deviates from Route C at the north end of Cornwell Road after crossing the headwaters of Buggy Creek. Route A continues southeast from this point on the west side of Dry Fork Creek until it parallels Montana Highway 24 approximately 6 miles north of St. Marie (Link 2, milepost 8.3). The route would continue south 1 mile west of Highway 24 past the Glasgow Base Ponds Fishing Access Site north of the intersection of Highway 24 and Olson Springs Road. The route would continue south 0.5 mile west of Highway 24 for nearly 14 miles. At Link 2, milepost 21.1, it would turn west to parallel the section line 2 miles north of Cut Across Road. The route would continue west almost to Highway 2 where Route A would become the same as Route C (see Section 2.4.2).

Route A would disturb more ground during construction than Route C (Proposed Action) (see Tables 2.3-8 and 2.3-10) because it would parallel fewer existing roads suitable for use during construction and because it would be a longer route. Consequently, short-term habitat impacts and long-term visual impacts would generally be greater. Route A would generally parallel Highway 24 and two 69kV lines for about 14 miles and directly parallel one 69kV line for over 2 miles, but would still be 0.5 mile west of Highway 24. BLM generally favors that new linear projects follow existing linear corridors, although no designated utility corridors are identified in this area in BLM's Approved Valley RMP (BLM 1994). DEQ, under MFSA, generally favors paralleling existing linear features to minimize impacts, although the alignment's location 0.5 mile from the highway would not minimize impacts.

Route A would be longer than Route C, and would cross more miles of private land (Route A, 13.3 miles; Route C, 10.9 miles).

Fragmentation would be similar to Route C although Route A would have more permanent ground disturbance because of the new access roads required to construct the line.

2.5 Mitigation and Monitoring Plan

An approved POD would be required by the BLM and DNRC prior to authorizing construction of each of the phases of the wind farm and of the transmission line. Wind Hunter would not initiate any construction or other surface disturbing activities on the public land portion of the right-of-way until after issuance of the BLM Grant or notice to proceed by the Authorized Officer, the State lease agreement and easements from DNRC, and a FONSI from Western. Wind Hunter would conduct all activities associated with the construction and operation in strict conformity with the POD.

DEQ Environmental Specifications are described in Appendix E and would apply to the 161/230kV transmission line. If the 161/230kV transmission line is approved, DEQ would monitor the construction of the transmission line to determine compliance with MFSA Certificate of Compliance conditions.

Western also requires that a MAP support the EA and final FONSI. The purpose of the MAP will be to facilitate the implementation of mitigation actions that must be performed under Western's NEPA jurisdiction, and disclose other actions that would be monitored by Western and other agencies to mitigate impacts.

The agencies hope to incorporate all mitigation measures and monitoring requirements together into a Consolidated Mitigation Plan that will serve as DEQ Environmental Specifications, the BLM and DNRC POD, Western's MAP, and DNRC's mitigation and stipulations. This plan will be developed and approved by the Lead and Cooperating Agencies prior to DEQ's certification decision. Wind Hunter's Committed Mitigation Measures are listed in Appendix A.

Through the MFSA process, DEQ has identified two modifications to Transmission Routes A and C that Wind Hunter has agreed to implement as mitigation measures (Figure 2.5-1). These are:

- On Link 4 between mileposts 0.7 and 1.8, DEQ requested a change in the alignment (shared by Routes A and C) to avoid a parcel of private land. MFSA requires that transmission lines avoid private land where feasible. The adjusted alignment would avoid 4,100 feet of private land and would cross U.S. Highway 2 farther north than the original alignment.
- On Link 1 between mileposts 1.1 and 4.4, DEQ requested a change in the alignment (shared by Routes A and C) to avoid two parcels of private cultivated land. MFSA requires that transmission lines avoid cultivated land where feasible. The adjusted alignment would avoid 1,750 feet of cultivated land and instead extend through rangeland near the original alignment.

In addition, Wind Hunter has agreed to the following mitigation measure (Figure 2.5-1):

- Wind Hunter would not cross Buggy Creek (Link 1, milepost 3.8) with construction access for either Route A or Route C. An existing road from Kerr Cow Camp would be used to access the west side of Buggy Creek, and Cornwell Road would be used to access the east side of Buggy Creek. By not building an access road across Buggy Creek, unwanted crossings of the creek would be eliminated and access in the general area would be similar to existing conditions.

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Table 2.4-1 Summary Comparison of Impacts of Proposed Action and Alternatives

		Wind Farm & Substation (Acres) & Transmission Routes (Miles)	Ground Disturbance	Agricultural Lands	Land Jurisdiction/Ownership	Residences w/in 1/4 mi.	Residences Within 5 Miles of Wind Farm	Miles of Transmission Route within 500' of Existing Access	BLM VRM Classes Occupied (Acres) or Crossed (Miles)	Visual Impact	Project Economics	Avian and Upland Bird Impact	Mule Deer Winter Range	Native Vegetation (Permanent Disturbance)	Overall Biological Impact	Stream Crossings, Wetlands, Floodplain	Soil Erosion Potential	Geohazards	Paleontology	Cultural Resources	Comments
Proposed Action and Alternatives	Proposed 500 MW Wind Energy Facility	20,120 acres	Temp. 544 acres Perm. 183 acres	15.9 acres Perm. Loss Dryland Ag 166.7 acres Perm. Loss Pasture/ Rangeland 0 acres Perm. Loss CRP Land	BLM - 11, 279 acres State - 1,952 acres Private - 6,889 acres	0	0	NA	128 acres Class II 11,151 acres Class IV	185 High impact turbines 149 Moderate impact turbines	Capital Cost - $160 million Labor Cost - $361 million	Annual fatalities - 10 raptor 402-600 passerine	Loss of 34 acres	101.4 acres	Low to moderate depending on species.	Headwaters of several small creeks in area 60 wetlands	7,362 acres of soils with high erosion potential	1,610 acres > 8% slope 7,847 acres Bearpaw Shale (39%) > 8% slope	Moderate sensitivity	27 resources, 10% surveyed;	Wildlife and fragmentation impacts expected to be low to moderate depending on species. Agricultural uses of the land continues. Some turbines would affect solitude in Bitter Creek Wilderness Study Area.
	Alternative Transmission Route A	41.5 miles	Temp. 89 acres Perm. 109 acres	2.7 acres Perm. Loss Ag Land 105.8 acres Perm. Loss Pasture/Rangeland 0.3 acres Perm. Loss CRP Land	BLM - 11 miles State - 17 miles County - 0.2 miles Private - 13.3 miles	2	NA	10.5 miles	0.9 miles Class II 10.9 miles Class IV	5.3 miles high impact 12.1 miles moderate impact	Capital cost - $5.0 to $5.7 million Labor cost - $5.0 to $5.7 million	3 sharp-tailed grouse leks within 2 miles	No Loss	111.5 acres	Low	54 stream crossings, 5 with mapped floodplains (FEMA data incomplete) 10 wetlands (NWI data incomplete)	66 acres of soils with high erosion potential; 102 acres of soils with moderate erosion potential	1.6 miles > 8% slope 1.2 miles Bearpaw Shale (access road) > 8% slope	No identifiable, moderate, or high sensitivity	2 resources; 9% surveyed	Higher land use and visual impacts than Route C. More ground disturbance from construction activities.
	Proposed Transmission Route C	34.1 miles	Temp. 76 acres Perm. 71 acres	2.7 acres Perm. Loss Ag Land 67.8 acres Perm. Loss Pasture/Rangeland 0.3 acres Perm. Loss CRP Land	BLM - 12.7 miles State - 10.5 miles County - 0 miles Private - 10.9 miles	1	NA	18.7 miles	0.9 miles Class II 11.7 miles Class IV	4.9 miles high impact 7.8 miles moderate impact	Capital cost - $4.1 to $4.7 million Labor cost - $4.1 to $4.7 million	3 sharp-tailed grouse leks and 1 sage-grouse leks within 2 miles	Loss of up to 22.7 acres	70.2 acres	Low	33 stream crossings, 4 with mapped floodplains (FEMA data incomplete) 6 wetlands (NWI data incomplete)	48 acres of soils with high erosion potential; 87 acres of soils with moderate erosion potential	1.1 miles > 8% slope 0.8 miles Bearpaw Shale (access road) > 8% slope	No identifiable, moderate, or high sensitivity	2 resources; 10% surveyed	Less ground disturbance due to paralleling of existing Cornwell Road. Fewer visual impacts than Route A.
	Proposed Antelope Creek Substation	5 acres	Perm. 5 Acres	5 acres Perm. Loss Rangeland	BLM - 0 acres State - 0 acres County - 0 acres Private - 5 acres	0	NA	NA	0 acres	Moderate impact to 4 residences	Total construction cost $7.7 million	0 leks within 2 miles	No Loss	5 acres	Low	0 stream crossings 0 wetlands	5 acres moderate	0 acres > 8% slope 0 acres Bearpaw Shale > 8% slope	Moderate sensitivity	0 resources; 100% surveyed	Existing industrial setting due to the existing Richardson Coulee Substation.
No Action		NA	No Impact	No Impact	No Impact	NA	NA	NA	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No economic, job, or tax revenues would be realized. Landowners and agencies would continue present management.

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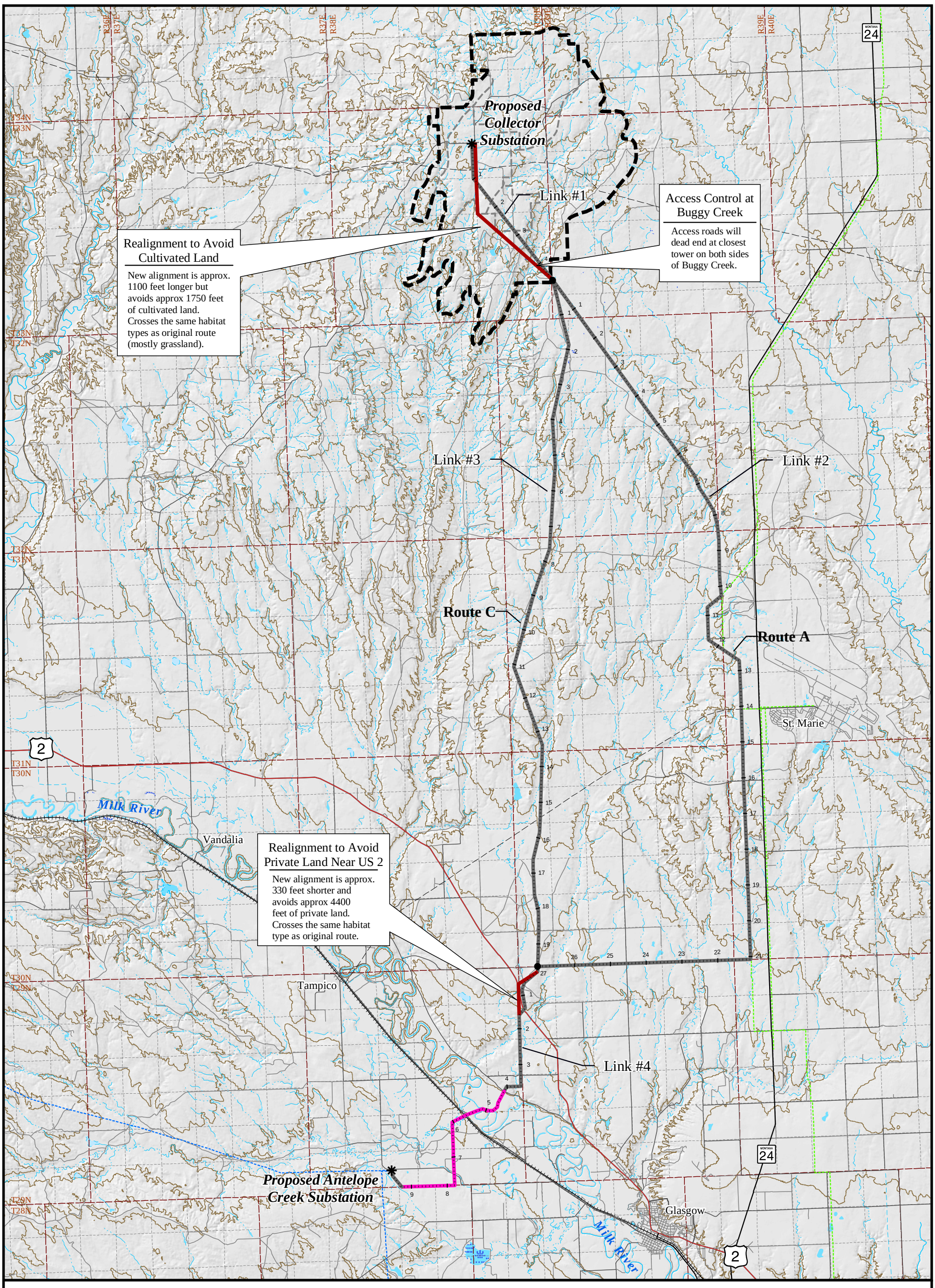

Legend

- Alternative Transmission Route
- Mile Markers
- Tenth Mile Marker
- Link Node
- H Frame Structure
- Single Pole Structure
- 500 MW Wind Project Area
- Wind Farm Phase Divider
- US Highway
- State Highway
- Paved Arterial Road
- Gravel or Graded Arterial Road
- Local or Minor Road
- Railroad
- 230kV Transmission Line Energized at 161kV
- Other Transmission Line
- Pipeline
- Township Line
- Section Line
- Index Contour (100' Interval)
- River or Stream
- Intermittent Stream
- Canal
- Lake or Pond
- Intermittent Pond
- Swamp or Marsh
- Proposed Substation

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Figure 2.5-1

Additional Mitigation Measures Along Transmission Routes A and C

0 0.5 1 2 3 4 5 6

Miles

1:158,400 or 1" = 2.5 Miles

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CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1. Introduction

This chapter provides a description of the affected environment in the VCWEP area and the potential environmental consequences, or impacts, that could result from the construction, operation and maintenance, and decommissioning of the wind farm, the 161/230kV transmission line, and the Antelope Creek Substation. Specific resources are addressed in Sections 3.2 through 3.15. In these sections, environmental consequences are discussed for the Proposed Action, which includes the wind farm, substation, and Transmission Route C; Alternative A, which includes the wind farm, substation, and Transmission Route A; and the No Action Alternative.

Chapter 3 also discusses the electric transmission grid and reliability (Section 3.16), cumulative impacts (Section 3.17), irreversible and irretrievable commitment of resources (Section 3.18), and unavoidable adverse impacts (Section 3.19).

The resources addressed in Chapter 3 fall into two broad categories:

1. Human Environment
   - Land Use (Section 3.2)
   - Transportation (Section 3.3)
   - Visual Resources (Section 3.4)
   - Socioeconomics and Public Services (Section 3.5)
   - Environmental Justice (Section 3.6)
   - Cultural Resources (Section 3.12)
   - Health and Safety (Section 3.13)
   - Noise (Section 3.14)
2. Natural Environment
   - Biological Resources (Section 3.7)
   - Water Resources and Wetlands (Section 3.8)
   - Geology and Geohazards (Section 3.9)
   - Soils (Section 3.10)
   - Paleontology (Section 3.11)
   - Air Quality (Section 3.15)

Council on Environmental Quality (CEQ) regulations and guidance indicate that the amount of analysis in an EA or EIS should correspond to the importance of the issues: significant issues should be discussed more thoroughly than less significant issues. In this EA, the level of detail and the amount of analysis presented in each section of Chapter 3 correspond to the issues raised about the VCWEP during the public scoping process and agency consultation (see Chapter 4). For this reason, Section 3.7 (Biological Resources) and Section 3.4 (Visual Resources) have more extensive descriptions of the affected environment and analyses of environmental consequences than other sections.

Impacts can be beneficial (positive) or adverse (negative), and can result from the VCWEP action directly or indirectly. Impacts can be long-term or short-term. Long-term impacts are defined as those that would substantially remain for the life of the VCWEP or beyond. Short-term impacts are defined as those changes to the environment during construction that generally would revert to pre-construction condition at, or within a few years of, the end of construction. Impacts can vary in significance from no change or only slightly discernible change to a full modification of the environment.

In order to determine impact intensity, the following criteria were used in the analysis of environmental consequences in this EA:

Resource sensitivity – the probable response of a particular resource to project-related activities.

Resource quality – the pre-project condition of the resource potentially affected.

Resource quantity – the amount of the resource potentially affected.

Duration of impact – the period of time over which the resource would be affected, measured as short-term (within a few years) or long-term (life of the VCWEP and beyond).

Time of year – the season or period of time in which the resource would be affected.

3.2 Land Use

This section provides a description of the land jurisdiction and ownership and of land uses that occur within the four phases of the wind farm, the 161/230kV transmission route alternatives A and C and the Antelope Creek Substation site. It also discusses potential land use impacts of the VCWEP and identifies mitigation measures designed to limit or reduce those impacts.

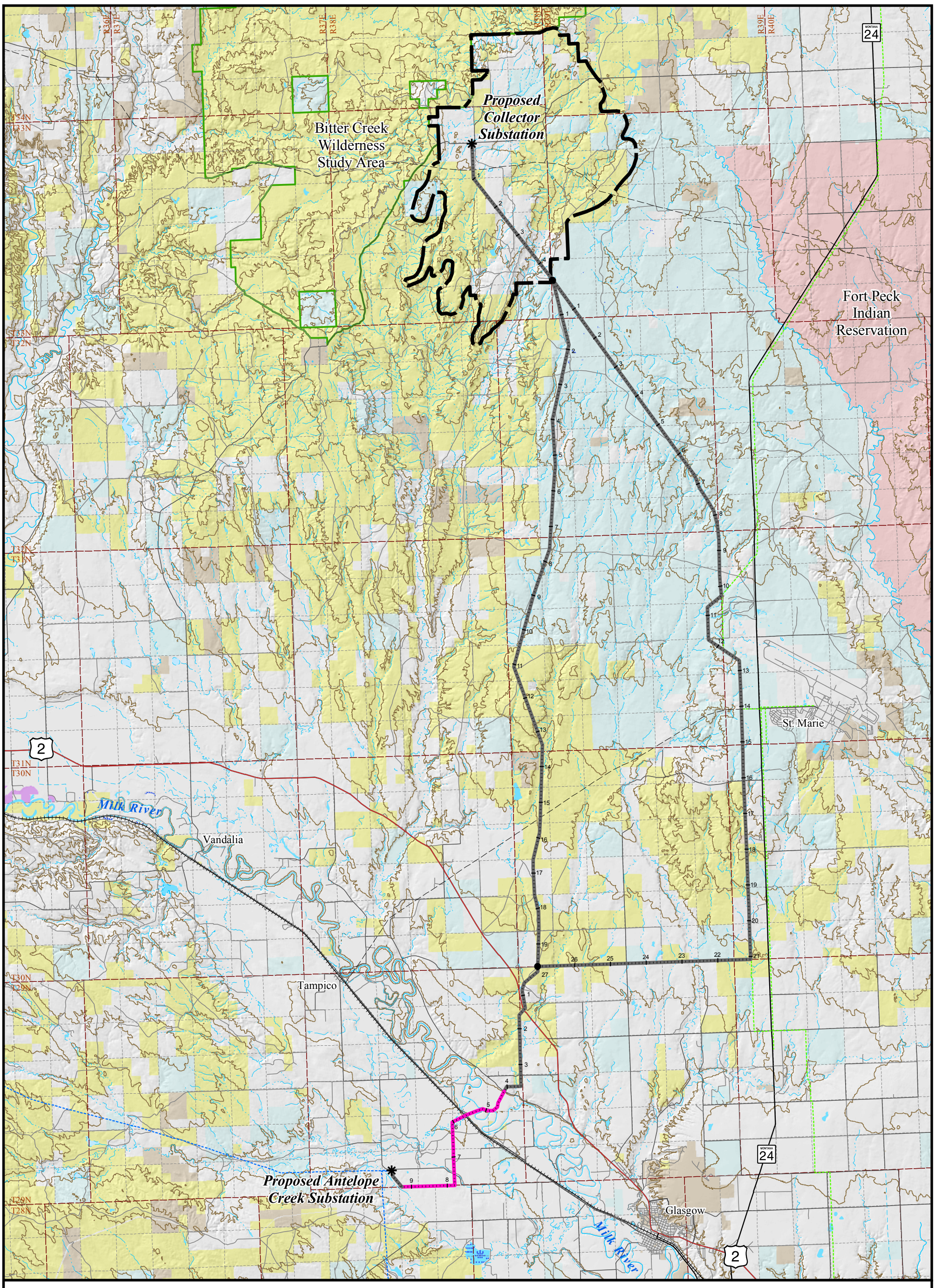
Appendix F provides an overview of current land uses within the VCWEP area. Emphasis is placed on areas where facilities associated with the VCWEP would be located. In addition, the information presented in Appendix F identifies specific Federal, State, and local agency jurisdictions within the VCWEP area; relevant planning documents; associated land use designations; and other regulatory considerations that may be applicable to the VCWEP.

3.2.1 Affected Environment

Inventory Methods

The land use inventory for the VCWEP area was compiled by reviewing, refining and updating existing data. Following this, interpretation was undertaken of existing maps, 1:12,000 U.S. Geological Survey (USGS) 1996 black-and-white Digital Orthophoto Quarter Quadrangles (DOQQs), and selected 2002 and 2005 color FSA aerial photographs. The mapped information was verified by ground reconnaissance between June and September 2004. In addition, Federal, State, and local land resource agencies and organizations were contacted by telephone, by letter or through meetings to update official information and to solicit further input.

The components of the land use inventory include land jurisdiction and ownership; existing land use; planned land use; parks, recreation, and preservation areas; and wilderness. Two land use inventory maps portray information relating to each component (Figures 3.2-1 and 3.2-2). The VCWEP data were compiled for land use within the wind farm's up-to-500MW full build-out area and out to 5 miles from the edge of the wind farm area to support the visual analysis (see Section 3.4). Data were also collected within a 4-mile-wide study corridor (2 miles on each side of the centerline) of each 161/230kV transmission line alternative; and within a 0.5-mile study area around the Antelope Creek Substation site.



Legend

- Alternative Transmission Route
- Mile Markers
- Tenth Mile Marker
- Link Node
- H Frame Structure
- Single Pole Structure
- 500 MW Wind Project Area
- US Highway
- State Highway
- Paved Arterial Road
- Gravel or Graded Arterial Road
- Local or Minor Road
- Railroad
- 230kV Transmission Line Energized at 161kV
- Other Transmission Line
- Pipeline
- Township Line
- Section Line
- Index Contour (100' Interval)
- River or Stream
- Intermittent Stream
- Canal
- Lake or Pond
- Intermittent Pond
- Swamp or Marsh
- Proposed Substation
- Bitter Creek Wilderness Study Area
- Fort Peck Indian Reservation
- USDI Bureau of Land Management
- USDI Bureau of Reclamation
- State of Montana
- Local Government
- Private

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Figure 3.2-1

Land Jurisdiction

0 0.5 1 2 3 4 5 6

Miles

1:158,400 or 1" = 2.5 Miles

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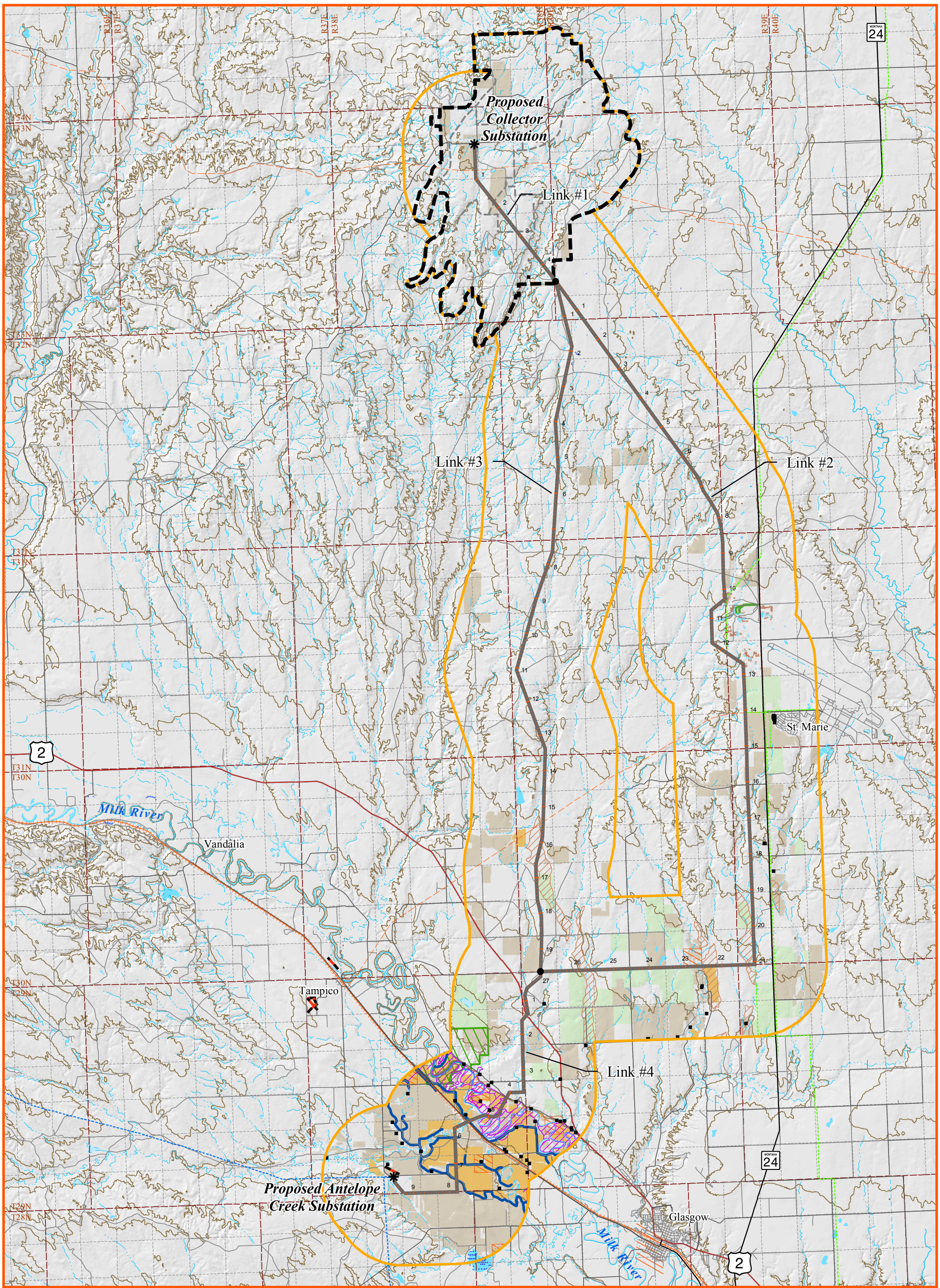

Legend

- Alternative Transmission Route
- Mile Markers
- Tenth Mile Marker
- Link Node
- 500 MW Wind Project Area
- Wind Farm Phase Divider
- Study Area
- US Highway
- State Highway
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- Other Transmission Line
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- Index Contour (100' Interval)
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- Intermittent Stream
- Canal
- Lake or Pond
- Intermittent Pond
- Swamp or Marsh
- Proposed Substation
- Home or Residence
- Airport or Airstrip
- Irrigation Canal
- Farmland of Statewide Importance
- Prime Farmland if Irrigated
- Conservation Easement
- Apiary
- Residential or Urban
- Quarry or Mine
- CRP Land
- Irrigated Cropland
- Dryland Cultivation

VALLEY COUNTY WIND ENERGY PROJECT

Figure 3.2-2

Land Use

0 0.5 1 2 3 4 5 6

Miles

1:158,400 or 1" = 2.5 Miles

POWER ENGINEERS

Print Date : April 28, 2006

WIND HUNTER

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Wind Farm

The following discussion provides a description of land jurisdiction and ownership as well as land uses specific to the wind farm area. A summary of land status and use is also provided by wind farm development phase.

Land Jurisdiction and Ownership

The proposed wind farm would be located in north-central Valley County approximately 30 miles northwest of the City of Glasgow. The wind farm area encompasses a total of 20,120 acres with land jurisdiction and ownership consisting of a mixture of BLM, State and private lands. Table 3.2-1 shows land surface jurisdiction/ownership by phase within the wind farm area. Land jurisdiction and ownership are depicted in Figure 3.2-1.

Table 3.2-1 Land Jurisdiction/Ownership – Wind Farm

Phase	BLM (acres)	State of Montana (acres)	Private (acres)	Total (acres)
I	261	284	549	1,094
II	1,050	21	1,729	2,800
III	2,307	753	2,460	5,520
IV	7,661	894	2,151	10,706
Total	11,279	1,952	6,889	20,120

Source: Montana State Library, NRIS 2005

Existing and Planned Land Use

Existing Land Use

The wind farm area is characterized by a rural landscape of rolling plains and tablelands. No residences are located within the wind farm area. Livestock grazing is the principal land use, although non-irrigated cropland (dryland agriculture) is present as well. No Important farmland, as defined by the Natural Resources Conservation Service (NRCS), or Conservation Reserve Program (CRP) lands are located in the wind farm area. Existing land use is depicted in Figure 3.2.2.

BLM grazing allotments and Montana School Trust Lands leased for grazing use were identified within all four phases of the wind farm area.

Grazing land (non-irrigated pasture/rangeland) is the largest agricultural use classification at 94 percent of the total wind farm area. The other 6 percent is classified as non-irrigated cropland. Table 3.2-2 summarizes agricultural land (cropland) and non-irrigated pasture/rangeland within the wind farm area.

Table 3.2-2 Agricultural Land (Cropland) and Non-irrigated Pasture/Rangeland in the Wind Farm Area

Phase	Agricultural Land (Dryland Cultivated) (acres)	Non-irrigated Pasture/Rangeland (acres)	Total (acres)
I	249	845	1,094
II	583	2,217	2,800
III	367	5,153	5,520
IV	0	10,706	10,706
Total	1,199	18,921	20,120

A Northern Border Pipeline Company 42-inch natural gas pipeline is located in Phases I, II and IV. The associated compressor station and microwave facility are within Phase IV.

Federal oil and gas leases were identified in Phases I, II, III, and IV of the wind farm area, while State oil and gas leases were identified in Phases I, III, and IV (refer to Figure 3.17.1).

Planned Land Use

Public lands administered by the BLM in the wind farm area are guided by the Approved Valley Resource Area RMP (BLM 1992). According to the RMP, livestock grazing will continue to be managed through development and monitoring of allotment management plans (AMP) or similar grazing plans and supervision of grazing use. Rights-of-way outside Wilderness Study Areas (WSAs) are considered on a case-by-case basis with appropriate stipulations from BLM Manual Handbook H-2801-1 incorporated into the Right-of-Way Grant.

Valley County currently does not have an adopted county Comprehensive Plan. Valley County is not zoned, nor does it have any special/conditional use permit requirements for wind farms.

There is a likelihood of additional oil and gas exploration in the wind farm area in the future (see Section 3.17).

Parks, Recreation, and Preservation Areas

Dispersed recreation opportunities exist within the wind farm area and primarily consist of hunting, wildlife viewing, and off-highway vehicle (OHV) travel. Hunting occurs on both private and public lands. The Bitter Creek WSA Wildlife Viewing Area draws tourists to the area west of the proposed wind farm.

Bitter Creek Wilderness Study Area

The Bitter Creek WSA is located immediately west and north of Phases I and III of the wind farm boundary (Figure 3.3-3). The WSA contains 59,660 acres of land located in three roadless segments identified as Bitter Creek South (8,605 acres), Bitter Creek West (11,105 acres), and Bitter Creek East (39,950 acres). Lands within the WSA are predominantly public lands managed by the BLM, but there are also State of Montana and private inholdings.

The Bitter Creek WSA has rugged, highly dissected terrain dominated by drought- and salt-tolerant plants (Cooper et al. 2001). It has steep hillsides, buttes, and pinnacles, and the rim along the eastern boundary of the WSA (the western boundary of the proposed wind farm) is about 600 feet higher than the Bitter Creek channel. Raptors are common and the WSA is important mule deer habitat (see Section 3.7 Biological Resources). Recreational uses of the WSA include hunting, hiking, sight-seeing, nature

viewing, photography, camping, backpacking, and horseback riding (Power Engineers 2004). OHV use within the WSA is restricted year-round to numbered roads. Under the Federal Watchable Wildlife Program, the BLM has established the Bitter Creek WSA Wildlife Viewing Area along the rim just west of the proposed wind farm. The Bitter Creek WSA is not a completely undeveloped area. Within its boundaries are roads, trails, fences, small reservoirs, and the Northern Border Pipeline, constructed in 1981.

In 1976 the Federal Land Policy and Management Act (FLPMA) directed the Secretary of the Interior to review the wilderness potential of some roadless BLM lands. The BLM inventoried its lands in 1978 and 1979 and designated potentially suitable areas as Wilderness Study Areas, or WSAs. BLM issued a decision in 1980 recommending that the Bitter Creek area be studied for wilderness suitability.

The Final Bitter Creek Wilderness EIS (BLM 1989) addressed the suitability of the WSA for wilderness designation. Specific mandatory criteria were used to determine the area's wilderness quality, including: 1) naturalness, 2) outstanding opportunities for solitude, and 3) outstanding opportunities for primitive unconfined recreation. The EIS concluded that naturalness was a characteristic of the WSA; that there were no opportunities for primitive and unconfined recreation in the WSA; and that outstanding opportunities for solitude characterized one of the three WSA segments: Bitter Creek East (BLM 1989). According to the EIS (BLM 1989:102), "The Bitter Creek WSA contains marginal opportunities for solitude. The majority of the WSA (60 percent) is bounded by an exterior road system that produces numerous offsite sights and sounds. Any human activities inside or near the WSA would detract from the solitude opportunities due to the lack of screening available. The exception is the core area of the Bitter Creek East roadless segment. The sheer size of this section (39,950 acres) allows a number of visitors to use the area at the same time without an undue effect on outstanding solitude values." The "core area" of Bitter Creek East was not defined in the EIS. Based on BLM's assessment of mandatory wilderness criteria, BLM recommended that no part of the Bitter Creek WSA be given wilderness designation by Congress (BLM 1989; J. Collins, personal communication 2006).

Since 1989, the Bitter Creek WSA has been managed under the BLM's Interim Management Policy for Lands under Wilderness Review (H-8550-1). Under this policy, the BLM's primary interim management goal is to manage and protect those public lands that are under wilderness review in such a manner so as to not impair the area's suitability for preservation as wilderness until it is designated by Congress as wilderness, or until the WSA is released from further wilderness consideration. The Bitter Creek WSA is managed to protect its wilderness characteristics and values pending a decision by Congress on BLM's recommendation in the 1989 EIS and Record of Decision. The Interim Management Policy identifies non-impairment criteria and specifies that any use, facility, or activity within a WSA must be temporary, not disturb the surface or permanently establish facilities, and be easily terminated upon designation of the area. Also, wilderness values must not be degraded so far as to significantly constrain the area's suitability for preservation as wilderness (see also Gorte and Baldwin 2004). The WSA currently contains a number of man-made features, including roads, trails, fences, small reservoirs, and the Northern Border Pipeline. There are also parcels of private and State of Montana land within the WSA.

In 2000, the Bitter Creek WSA was also designated by the BLM as an Area of Critical Environmental Concern (ACEC) (BLM 2000a). An ACEC is a designation that highlights areas where special management attention is needed to protect and prevent irreparable damage to important historic, cultural and scenic values, fish and wildlife resources, or other natural systems or processes; or to protect human life and safety from natural hazards. The Bitter Creek WSA's designation as an ACEC was based on a 1997 evaluation that this area met the ACEC relevance criteria for scenic, cultural, wildlife, and natural system/vegetation and met the ACEC importance criteria as a natural system due to the "lack of influence of developments and roads" and because it "is exemplary of a properly functioning prairie ecosystem."

The ACEC designation is an overlay on the WSA status of the Bitter Creek area, and the area would be managed as an ACEC if Congress follows the BLM's recommendation to release the Bitter Creek area

from wilderness consideration. BLM would then develop an ACEC management plan to protect the area's natural system values. Private and State of Montana lands located adjacent or within the boundaries of an ACEC would not be subject to BLM's prescribed management for the ACEC (BLM 2000a, 2005b; J. Collins, personal communication 2006).

Transmission Route C

Land Jurisdiction and Ownership

The 4.0-mile-wide study corridor for the 34.1-mile Transmission Route C is located entirely in Valley County. BLM public land represents 37.2 percent of the land crossed by this alternative route. Montana School Trust Land comprises 30.8 percent of the land crossed, while private land makes up 32.0 percent. Land jurisdiction/ownership crossed by Transmission Route C is depicted in Table 3.2-3 and Figure 3.2-1.

Table 3.2-3 Land Jurisdiction/Ownership Crossed by Transmission Route C

Land Jurisdiction/Ownership	Miles	Percent
BLM	12.7	37.2
State of Montana	10.5	30.8
Valley County	0.0	0.0
Private	10.9	32.0
Total	34.1	100.0

Source: Montana State Library, NRIS 2005

Existing and Planned Land Use

Existing Land Use

The study corridor is characterized by a rural landscape of rolling plains and tablelands. Livestock grazing is the principal land use in the study corridor, although irrigated cropland and non-irrigated cropland (dryland agriculture) are present as well. Residential development within the study corridor is for the most part dispersed and rural in character. Forty residential dwellings are located within the 4.0-mile-wide study corridor. No schools were identified in the study corridor.

Irrigated cropland within the study corridor is primarily found in the Milk River Valley. The land is irrigated primarily by surface flooding. Among the crops grown on irrigated land, the most common are alfalfa and small grains such as wheat and barley. Other crops include grass and grain hays, silage, safflower, corn, and livestock pasture. Non-irrigated cropland (dryland agriculture) comprises the bulk of cultivated land in the study corridor and is generally found on the adjacent uplands. Principal crops include wheat, barley, oats and grain hay. Much of the land is devoted to dryland agriculture cultivated under an alternate crop-fallow system.

The USDA Natural Resource Conservation Service (NRCS) classifies important farmland according to physical characteristics of the soil (moisture, temperature, pH, erodibility, permeability, etc.). Using these criteria, a Montana state-wide Land Evaluation and Site Assessment (LESA) system classifies important farmland as Prime, Unique, of Statewide Importance, or of Local Importance. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses.

Important farmland is also located in the study corridor. Prime Farmland if irrigated is crossed by Link 3 from milepost 16.0 to milepost 16.8. Farmland of Statewide Importance is crossed by Link 4 from milepost 4.1 to milepost 4.4 and from milepost 4.5 to milepost 5.1.

The Conservation Reserve Program (CRP), administered by the FSA, encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as native grasses, wildlife plantings, trees, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. CRP land is crossed by Link 3 from milepost 16.8 to milepost 17.7.

BLM grazing allotments and Montana School Trust Lands leased under agreement for grazing use were identified as being crossed in the study corridor.

Agricultural land (cropland) and non-irrigated pasture/rangeland crossed in the study corridor are presented by link and milepost in Table 3.2-4.

Glasgow Irrigation District canals are also located in the study corridor. The Vandalia South Main Canal and lateral canal V90 are crossed by Link 4 from milepost 7.4 to milepost 7.5. Link 4 crosses lateral canal V63 (from milepost 5.5 to milepost 5.6), lateral canal V85 (from milepost 6.2 to milepost 6.3), and lateral canal V90 (from milepost 7.0 to milepost 7.1).

Transmission Route C crosses 8.6 miles of authorized Federal oil and gas leases and no State oil and gas leases.

One DEQ permitted opencut sand and gravel operation, Maag, Permit #204, is located in the study corridor.

A Northern Border Pipeline compressor station and microwave facility are located within the study corridor for Transmission Route C. An additional microwave facility was identified adjacent to NWE's Richardson Coulee Substation.

Natural gas pipelines were also identified in the study corridor. The Northern Border 42-inch natural gas pipeline is crossed by Link 1 from milepost 0.7 to milepost 0.8 and a Williston Basin Interstate Pipeline Company 6-inch natural gas lateral (Valley Industrial Park) is crossed by Link 3 from milepost 15.4 to milepost 15.5. Two Williston Basin Interstate 10-inch and 8-inch natural gas pipelines are crossed by Link 4 from milepost 5.6 to milepost 5.7.

Planned Land Use

Planned land use for the 4.0-mile-wide study corridor for Transmission Route C is similar to planned land use discussed for the wind farm area (i.e., grazing, possible oil and gas exploration). No platted subdivisions have been identified in the study corridor.

Parks, Recreation, and Preservation Areas

Dispersed recreation opportunities within the study corridor primarily consist of hunting, fishing, wildlife viewing and OHV travel. Hunting occurs on both private and public lands.

The Bitter Creek WSA is located in the 4.0-mile-wide study corridor, although the centerline of Route C is 1 mile or more from the WSA boundary. The WSA offers a number of dispersed recreation opportunities. The Bitter Creek WSA has been selected for a wildlife viewing zone under the Watchable Wildlife program.

Three BLM undeveloped recreation sites were identified in the study corridor for Route C. These sites include two fishing reservoirs (Atlas and Langen) and a day use area along the Milk River (Faraasen

Table 3.2-4 Agricultural Land (Cropland) and Non-irrigated Pasture/Rangeland Crossed by Transmission Route C

Link	Milepost Begin	Milepost End	Distance (Miles)	Description/Classification*
1	0.0	0.8	0.8	Agricultural Land (Dryland Cultivated)
1	0.8	1.5	0.7	Non-Irrigated Pasture/Rangeland
1	1.5	2.0	0.5	Agricultural Land (Dryland Cultivated)
1	2.0	4.6	2.6	Non-Irrigated Pasture/Rangeland
3	0.0	16.8	16.8	Non-Irrigated Pasture/Rangeland
3	17.7	19.6	1.9	Non-Irrigated Pasture/Rangeland
4	0.0	4.1	4.1	Non-Irrigated Pasture/Rangeland
4	4.1	4.5	0.4	Agricultural Land (Flood Irrigated Cropland)
4	4.5	4.9	0.4	Agricultural Land (Dryland Cultivated)
4	4.9	5.1	0.2	Agricultural Land (Flood Irrigated Cropland)
4	5.1	5.9	0.8	Agricultural Land (Dryland Cultivated)
4	5.9	6.0	0.1	Agricultural Land (Flood Irrigated Cropland)
4	6.0	6.1	0.1	Agricultural Land (Dryland Cultivated)
4	6.1	6.2	0.1	Non-Irrigated Pasture/Rangeland
4	6.2	7.5	1.3	Agricultural Land (Flood Irrigated Cropland)
4	7.5	9.3	1.8	Agricultural Land (Dryland Cultivated)
4	9.3	9.8	0.5	Non-Irrigated Pasture/Rangeland
Subtotal			2.0	Agricultural Land (Flood Irrigated Cropland)
Subtotal			4.4	Agricultural Land (Dryland Cultivated)
Subtotal			26.7	Non-Irrigated Pasture/Rangeland

*Excludes CRP Land.

Park). Atlas Reservoir is located in T32N, R38E, Section 24, and Langen Reservoir in T33N, R38E, Section 26. Faraasen Park is approximately 6 miles northwest of Glasgow. Development plans for the park include a parking lot, an interpretive nature trail and improved wildlife habitat and riparian areas.

The 3,803-acre Tampico Ranch Conservation Easement WMA is located within the study corridor, 6 miles northwest of Glasgow. The management goal of this WMA is to provide year-round wildlife habitat by maximizing wetland productivity and planting agricultural fields, and to provide public recreational opportunities. Archery and rifle seasons for white-tailed deer are open to licensed hunters. Upland bird and waterfowl hunting opportunities exist for pheasants, ducks and geese. White-tailed deer and pheasants are present year-round for wildlife viewing. Waterfowl are abundant spring through fall, and beaver, muskrat, and mink are present year-round. Wildlife viewing on the Tampico property requires permission from ranch headquarters.

One interpretive point ("Buffalo Country") is within the study corridor. This site incorporates a roadside pull-out with an interpretive sign that describes a place and event of historical interest. The site, maintained by MDOT's Glendive District, is located along the south side of U.S. Highway 2, 5.8 miles northwest of Glasgow.

Transmission Route A

Land Jurisdiction and Ownership

The study corridor for the 41.5-mile Transmission Route A is also located entirely in Valley County. BLM public land represents 26.5 percent of the land crossed by this route. Montana School Trust Land comprises 41.0 percent of the land crossed, while Valley County land and private land make up 0.5 percent and 32.0 percent, respectively (Table 3.2-5; Figure 3.2-1).

Table 3.2-5 Land Jurisdiction/Ownership Crossed by Transmission Route A

Land Jurisdiction/Ownership	Miles	Percent
BLM	11.0	26.5
State of Montana	17.0	41.0
Valley County	0.2	0.5
Private	13.3	32.0
Total	41.5	100.0

Source: Montana State Library, NRIS 2005

Existing and Planned Land Use

Existing Land Use

The 4.0-mile study corridor for Transmission Route A is a rural landscape of rolling plains and tablelands. Livestock grazing is the principal land use, although irrigated cropland and non-irrigated cropland (dryland agriculture) are also present.

With the exception of the unincorporated community of St. Marie, residential development within the study corridor is for the most part dispersed and rural in character. Fifty-eight (58) residential dwellings are located within the study corridor. No schools were identified.

Irrigated cropland within the study corridor for Route A is identical to that discussed for Route C and is primarily found in the Milk River Valley. Non-irrigated cropland (dryland agriculture) comprises the bulk of cultivated land in the study corridor. As with Route C, much of the land devoted to dryland agriculture is cultivated under an alternate crop-fallow system. Important farmland is located in the study corridor. Prime Farmland if irrigated is crossed by Link 2 from milepost 20.3 to milepost 20.8, from milepost 21.2 to milepost 21.4, from milepost 22.1 to milepost 22.5, and from milepost 25.6 to milepost 25.9. Farmland of Statewide Importance is crossed by Link 4 from milepost 4.1 to milepost 4.4 and from milepost 4.5 to milepost 5.1. Agricultural land (cropland) and non-irrigated pasture/rangeland crossed in the study corridor are presented by link and milepost in Table 3.2-6.

CRP land is crossed by Link 2 from milepost 13.0 to milepost 14.1, from milepost 19.8 to milepost 20.1, from milepost 22.8 to milepost 23.5, from milepost 24.1 to milepost 25.1, and from milepost 25.8 to milepost 26.3. BLM grazing allotments and Montana School Trust Lands occur within the study corridor for Route A. One registered general (commercial) apiary site is crossed by Link 2 from milepost 22.5 to milepost 23.1.

The Glasgow Irrigation District’s Vandalia South Main Canal, lateral canal V90, lateral canal V63, lateral canal V85, and lateral canal V90 are crossed by Route A.

Transmission Route A crosses 8.7 miles of authorized Federal oil and gas leases and 6.1 miles of State leases.

Table 3.2-6 Agricultural Land (Cropland) and Non-irrigated Pasture/Rangeland Crossed by Transmission Route A

Link	Milepost Begin	Milepost End	Distance (Miles)	Description/Classification*
1	0.0	0.8	0.8	Agricultural Land (Dryland Cultivated)
1	0.8	1.5	0.7	Non-Irrigated Pasture/Rangeland
1	1.5	2.0	0.5	Agricultural Land (Dryland Cultivated)
1	2.0	4.6	2.6	Non-Irrigated Pasture/Rangeland
2	0.0	9.4	9.4	Non-Irrigated Pasture/Rangeland
2	9.4	10.0	0.6	Agricultural Land (Dryland Cultivated)
2	10.0	13.0	3.0	Non-Irrigated Pasture/Rangeland
2	14.1	14.9	0.8	Agricultural Land (Dryland Cultivated)
2	14.9	15.5	0.6	Non-Irrigated Pasture/Rangeland
2	15.5	16.0	0.5	Agricultural Land (Dryland Cultivated)
2	16.0	19.8	3.8	Non-Irrigated Pasture/Rangeland
2	20.1	22.1	2.0	Non-Irrigated Pasture/Rangeland
2	22.1	22.5	0.4	Agricultural Land (Flood Irrigated Cropland)
2	22.5	22.8	0.3	Agricultural Land (Dryland Cultivated)
2	23.5	24.1	0.6	Agricultural Land (Dryland Cultivated)
2	25.1	25.8	0.7	Non-Irrigated Pasture/Rangeland
2	26.3	27.0	0.7	Non-Irrigated Pasture/Rangeland
4	0.0	4.1	4.1	Non-Irrigated Pasture/Rangeland
4	4.1	4.5	0.4	Agricultural Land (Flood Irrigated Cropland)
4	4.5	4.9	0.4	Agricultural Land (Dryland Cultivated)
4	4.9	5.1	0.2	Agricultural Land (Flood Irrigated Cropland)
4	5.1	5.9	0.8	Agricultural Land (Dryland Cultivated)
4	5.9	6.0	0.1	Agricultural Land (Flood Irrigated Cropland)
4	6.0	6.1	0.1	Agricultural Land (Dryland Cultivated)
4	6.1	6.2	0.1	Non-Irrigated Pasture/Rangeland
4	6.2	7.5	1.3	Agricultural Land (Flood Irrigated Cropland)
4	7.5	9.3	1.8	Agricultural Land (Dryland Cultivated)
4	9.3	9.8	0.5	Non-Irrigated Pasture/Rangeland
Subtotal			2.4	Agricultural Land (Flood Irrigated Cropland)
Subtotal			7.2	Agricultural Land (Dryland Cultivated)
Subtotal			28.2	Non-Irrigated Pasture/Rangeland

*Excludes CRP Land.

One DEQ permitted opencut sand and gravel operation, Maag, Permit #204, is located in the study corridor.

The Northern Border compressor station and microwave facility are located within the study corridor for Route A. Additional microwave facilities include a facility next to NWE's Richardson Coulee Substation and a communication site associated with a Nemont Telephone Cooperative building west of Montana Highway 24, 3 miles southwest of St. Marie.

Natural gas pipelines and proposed water distribution lines were also identified in the study corridor. A Northern Border 42-inch natural gas pipeline is crossed by Link 1 from milepost 0.7 to milepost 0.8 and a Williston Basin Interstate 6-inch natural gas lateral (Valley Industrial Park) is crossed by Link 2 from milepost 14.0 to milepost 14.1. Two Williston Basin Interstate 10-inch and 8-inch natural gas pipelines are crossed by Link 4 from milepost 5.6 to milepost 5.7. Link 2 also crosses a proposed Dry Prairie Rural Water Supply water distribution line from milepost 16.0 to milepost 16.1.

Planned Land Use

Planned land use for Route A is similar to that discussed for Transmission Route C and the wind farm area.

Parks, Recreation, and Preservation Areas

Dispersed recreation opportunities exist within the study corridor for Route A and primarily consist of hunting, fishing, wildlife viewing and OHV travel. Hunting occurs on both private and public lands.

The Bitter Creek WSA is located in the study corridor, but 1 mile or more from the centerline, and offers a number of dispersed recreation opportunities.

Three BLM undeveloped recreation sites were identified in the study corridor. These sites include two fishing reservoirs (Langen and Shoot) and a day use area along the Milk River (Faraasen Park). Langen Reservoir in located in T33N, R38E, Section 26, and Shoot Reservoir in T28N, R38E, Section 10. Faraasen Park is discussed under Transmission Route C.

The 3,803-acre Tampico Ranch Conservation Easement WMA is located within the study corridor for Route A, 6 miles northwest of Glasgow. This WMA is also discussed under Transmission Route C.

One Section 6(f) (Land and Water Conservation Funds Act) site, Glasgow Base Pond Fishing Access, was identified in the Route A study corridor. It is administered by the MFWP.

Antelope Creek Substation

Land Jurisdiction and Ownership

The proposed substation site is located in Valley County, adjacent to NWE's Richardson Coulee Substation, on 5 acres of private land. Land ownership within the 0.5-mile study area around the proposed substation is also private. The new substation would be constructed, owned, and operated by Western.

Existing and Planned Land Use

Existing Land Use

Land within the proposed substation site is currently rangeland used for livestock grazing (cattle). Within the 0.5-mile study area, one residence is located 1,900 feet northwest of the proposed substation. Other land uses within the study area include the Billingsley private airstrip to the north, the Richardson Coulee Substation and associated microwave facility to the west, and agricultural land (dryland cultivated) to the south.

Planned Land Use

The proposed substation site is not zoned. There are no Valley County special/conditional use permit requirements for electrical substations.

Parks, Recreation, and Preservation Areas

No existing or proposed parks, recreation, and preservation areas exist on or within 0.5 mile of the proposed substation site.

3.2.2 Environmental Consequences

This section discusses potential land use impacts that could occur as a result of the physical and operational effects of the VCWEP. Where land use impacts were identified, an evaluation was conducted to determine if one or more mitigation measures would be effective in avoiding or reducing (e.g., intensity or duration) the potential impact. Generic mitigation measures were applied to all affected areas as part of the VCWEP. Selectively committed mitigation measures and BMPs, as described in BLM's Wind Energy Development PEIS (BLM 2005) and in the MFSA Application (POWER Engineers 2004), were applied on a case-by-case basis where appropriate. Mitigation measures are listed in Appendix A.

The predicted effects of the VCWEP were compared with the existing environment to determine impacts on land use resources. Applying these criteria to the wind farm, 161/230kV transmission line, and Antelope Creek Substation yielded qualitative levels of high, moderate, low or no-identifiable impacts as defined below.

High Impact - Assigned to those land use categories where the officially stated or approved land use restriction, plan or policy would be violated; where land use sensitivity was major; or where the sensitivity was moderate but modified by moderate to high quantity levels. Land use impacts were considered high if the VCWEP would substantially preclude the primary existing or planned use of the land, result in a major change in overall land use patterns, create considerable conflict with permitted land uses, substantially alter existing recreational activities, or create extensive new recreational opportunities in the area.

Moderate Impact - Assigned to those land use categories whose sensitivity is moderate or where sensitivity is minimum and quantity is high. Land use impacts were considered moderate if the VCWEP would create a modest change in the primary existing or planned use of the land, cause a modest change in overall land use patterns or recreational opportunities, or slightly conflict with permitted land uses.

Low Impact - Assigned to those land use categories where sensitivity is minimal (excluding the above). Land use impacts were considered low if the VCWEP would not noticeably change the primary existing or planned use of the land, would cause at most a minor change in overall land use patterns or recreational opportunities, and would not conflict with permitted land uses.

No-Identifiable Impact - Assigned to those land use categories where no measurable impact would occur. Small changes and stresses to land use are not always adverse; some impacts are neutral and therefore not considered identifiable.

Inventoried land uses were evaluated to determine the types of potential direct and indirect impacts that could occur from the Proposed Action and alternatives. Impacts on land uses were considered adverse if the VCWEP would:

- Displace, alter, or otherwise physically affect any existing, developing or planned residential, commercial, industrial, governmental or institutional use or activity.
- Displace, alter, or otherwise physically affect any existing agricultural use or activity.
- Displace, alter, or otherwise physically affect any existing or planned aviation facility or aviation travel-related activity.
- Alter or otherwise physically affect any established, designated or planned park, recreation, preservation, or educational use area or activity.
- Affect applicable general and regional plans or approved, adopted, or officially stated policies, goals, or operations of communities or governmental agencies.

No Action

Under the No Action alternative, the VCWEP would not be constructed and existing land and recreation uses in the VCWEP area would continue without the influence of the proposed project.

Proposed Action

Wind Farm

Potential direct impacts of the wind farm would include conversion of rural lands to commercial utility-related uses and potential conflicts between the wind farm and onsite and offsite recreation activities. These impacts could be associated with construction, operations, and decommissioning of any of the wind farm elements, including wind turbines, improved and new gravel access roads, electrical lines, the O&M facility, and the collector substation. Indirect land use and recreation impacts are not anticipated because the wind farm is not expected to substantially induce regional growth to the extent that it would change offsite land uses or use of offsite resource-based recreation areas. Potential impacts on adjacent land uses from construction-related noise and dust are discussed in Section 3.14, Noise, and Section 3.15, Air Quality.

Construction Impacts

Temporary Land Use Conversion. Land use impacts during construction of the wind farm and associated facilities would be moderate to low. With the exception of Phase IV, agricultural land (dryland cultivated) is located on private land currently leased to Wind Hunter. Construction activities would be coordinated with landowners to minimize disturbance of farm operations.

Direct construction impacts are anticipated to be moderate but temporary. Potential direct impacts from construction activities include temporary roads, material laydown areas, and other areas of ground disturbance (see Table 2.3-4). These disturbances would be added to existing land uses, which include crop production and cattle grazing. Wind farm construction would temporarily alter 544.2 acres at full build-out, interfering with existing agricultural land (dryland cultivated) and non-irrigated pasture/rangeland uses (grazing operations) (Table 3.2-7). Areas temporarily disturbed would be restored to their original condition. Cattle and other livestock would need to be removed from the most intensive construction areas, but livestock grazing, the primary land use in the area, could continue around wind farm facilities.

Parks, Recreation, and Preservation Areas. Overall, direct impacts to recreational resources and opportunities would be moderate to low. Wind farm construction activities would be intermittent and temporary (extending over portions of one recreation season for each phase). Recreation use, including OHV travel and big game and upland bird hunting, would be temporarily displaced from some of the lands occupied by wind turbine and associated facilities, but only during the construction period. Temporary impacts on private landowner-approved activities, such as hunting, could occur during wind farm construction. Potential conflicts between recreation users on BLM and State land and wind turbine construction could affect the use and enjoyment of activities, such as hunting and hiking, in the wind farm area. Most current recreation activity within the wind farm area, which consists of limited informal use, would be able to resume at current levels during operation and maintenance. There are no formal recreational facilities in the vicinity of the wind farm area. Construction of the wind farm could encourage sightseeing, but the number of possible visitors during construction is unknown.

Bitter Creek Wilderness Study Area. As documented in Section 3.2.1, BLM has recommended that the Bitter Creek WSA not be given wilderness status by Congress. Until Congress makes its decision, BLM's Interim Management Policy for Lands under Wilderness Review (H-8550-1) specifies that any use, facility, or activity within a WSA must be temporary, not disturb the surface or permanently establish facilities, and be easily terminated upon designation of the area. Also, wilderness values must not be

degraded so far as to significantly constrain the WSA's suitability for preservation as wilderness, should Congress decide to designate it as such.

In BLM's assessment in the Final Bitter Creek Wilderness EIS (BLM 1989) of the suitability of the Bitter Creek area for wilderness designation, the agency identified no opportunities for primitive and unconfined recreation. Therefore, the proposed wind farm would not degrade or impair this wilderness characteristic.

Naturalness was identified by the BLM as a wilderness characteristic of the entire Bitter Creek WSA. However, the proposed wind farm would be built entirely outside the WSA boundary, neither disturbing the surface nor permanently establishing facilities within the WSA. Therefore, the proposed wind farm would not degrade or impair the wilderness characteristic of naturalness.

The Bitter Creek Wilderness EIS (BLM 1989) identified outstanding opportunities for solitude as a wilderness characteristic for the core area of the eastern segment of the WSA, known as Bitter Creek East, but did not define the location or size of the core area. This eastern segment includes 39,950 acres. There could be short-term impacts to solitude during the construction phases of the wind farm due to construction-related noise, dust, and visual impacts. Because these impacts would be short-term and temporary, occurring only during the six-to-eight month construction period of each of the four wind development phases, they would not impair the WSA's suitability for preservation.

Operation and Maintenance Impacts

Permanent Land Use Conversion. Operations and maintenance impacts on land use would be moderate to low. Permanent land use impacts are based on the amount of land that would be displaced by wind farm facilities including the wind turbines, internal road network, collector substation, and O&M building, and by the compatibility of the wind farm and associated facilities with existing adjacent uses. The wind farm would permanently alter an estimated 182.6 acres of agricultural land (dryland cultivated) and non-irrigated pasture/rangeland to commercial utility use (i.e., wind farm development). This would be an unavoidable impact of the wind farm. Permanently converted acreage would comprise only a small portion of the wind farm area at full build-out: 15.9 acres of 1,199 acres (1.3 percent) of agricultural land (dryland cultivated) and 166.7 out of 18,921 acres (0.9 percent) of non-irrigated pasture/rangeland (Table 3.2-7). The 15.9-acre reduction would be for the life of the project (at least 20 years) and would represent less than 0.01 percent of the non-irrigated harvested cropland (371,000 acres) in Valley County. The reduction in non-irrigated pasture/rangeland would have a minimal impact on livestock grazing in Valley County given the county's abundance of pasture and unimproved grazing lands.

Private landowners would receive compensation for the wind farm use of their property through lease agreements with Wind Hunter.

The wind farm would be compatible with a wide variety of land uses and generally would not preclude wildlife habitat conservation, livestock grazing, oil and gas leasing, or other activities that currently occur within the wind farm area.

The potential does exist, however, for VCWEP wind turbines to cause line-of-sight communication interference with Northern Border Pipeline Company's C.S.1 CS01 microwave site and Crow Creek Tower microwave site. The 300-foot C.S.1 site is located southeast of the wind farm, while the 120-foot Crow Creek Tower site is located northwest of the wind farm. Section 3.13, Health and Safety discusses how wind turbines can interfere with microwave transmissions. Potential interference can be mitigated though minor shifts in tower location, changing the microwave transmission pattern, and other measures.

With the exception of aerial crop dusting, the wind farm would not appreciably disrupt current and planned agricultural uses of the land. Given the turbine spacing, the operation of agricultural equipment could continue, but some plowing patterns may have to be adjusted. The wind farm would not alter existing fencing around the site except to add gates to certain access roads. Landowners would have keys to lockable gates on private land.

Parks, Recreation, and Preservation Areas. The presence of wind turbines could affect the use and enjoyment of some recreational activities in the wind farm area. However, few, if any, restrictions on recreational activities are anticipated on BLM and State lands leased for wind energy use. Private landowner-approved recreational activities could occur during wind farm operations, depending on provisions of future lease agreements between Wind Hunter and the private landowners. Longer-term impacts could arise from the visual intrusion of wind farm facilities across landscapes that provide little or no visual screening, allowing them to be seen by WSA recreational visitors from certain perspectives (refer to Section 3.4 Visual Resources). The operating workforce for the wind farm would range from 5 to 16 employees depending on the phase. Because of the small size of the work force, no substantial increase in the demand for recreational services and opportunities would occur in the wind farm area. The wind farm may cause a minor increase in the number of sightseers, but this impact is expected to be low.

Table 3.2-7 Wind Farm Disturbance and Land Use by Phase (acres)

	Phase I	Phase II	Phase III	Phase IV	Full Build-out
Temporary Disturbance					
Agricultural Land (dryland cultivated)	16.4	20.6	10.2	0.0	47.2
Non-irrigated Pasture/Rangeland	43.9	71.1	145.8	236.2	497.0
Subtotal	60.3	91.7	156.0	236.2	544.2
Permanent Disturbance					
Agricultural Land (dryland cultivated)	7.5	5.4	3.0	0.0	15.9
Non-irrigated Pasture/Rangeland	16.9	17.9	43.0	88.9	166.7
Subtotal	24.4	23.3	46.0	88.9	182.6
Total	**84.7**	**115.0**	**202.0**	**325.1**	**726.8**

Bitter Creek Wilderness Study Area. As discussed above under Construction Impacts, until Congress makes its decision about wilderness designation, BLM will manage the Bitter Creek WSA according to the agency's Interim Management Policy (H-8550-1), which specifies that any use, facility, or activity within a WSA must be temporary, not disturb the surface or permanently establish facilities, and be easily terminated upon designation of the area. Also, wilderness values must not be degraded so far as to significantly constrain the WSA's suitability for preservation as wilderness.

As mentioned above, in the Final Bitter Creek Wilderness EIS (BLM 1989), the BLM identified no opportunities for primitive and unconfined recreation in the WSA. Therefore, operations and maintenance of the proposed wind farm would not degrade or impair this wilderness characteristic.

Naturalness was identified by the BLM as a wilderness characteristic of the entire Bitter Creek WSA. However, the proposed wind farm would be built entirely outside the WSA boundary, neither disturbing the surface nor permanently establishing facilities within the WSA. Therefore, operations and maintenance of the proposed wind farm would not degrade or impair the wilderness characteristic of naturalness.

The Bitter Creek Wilderness EIS (BLM 1989) identified outstanding opportunities for solitude as a wilderness characteristic for the core area of the eastern segment of the WSA, known as Bitter Creek East, but did not define the location or size of the core area. This eastern segment includes 39,950 acres. The proposed wind farm could have a minor effect to the opportunities for solitude in the core of Bitter

Creek East due to the presence of the wind turbines, the wind turbine blades turning in the wind, FAA-required lighting, and vehicle travel for wind farm operations and maintenance.

Within 4 miles of the wind farm boundary, some of the wind turbines would be visible (i.e., would not be screened by terrain or vegetation) from approximately 21,500 acres within Bitter Creek East. It is expected, therefore, that some turbines would visually impact the solitude in the Bitter Creek East area (also refer to Section 3.4 Visual Resources).

Most of the visible turbines would not be located on public lands managed by the BLM. Of the 7.1 miles forming the proposed wind farm's border along Bitter Creek East, 6.2 miles (87 percent) is privately owned and 0.9 mile is managed by the BLM. Also, although turbine layout illustrated in Figure 2.3-1 is preliminary, the locations were used to estimate the distance of turbines from the boundary of Bitter Creek East. Table 3.2-8 illustrates that the majority (76 percent) of turbines within 1.0 mile of the boundary would be on private leased land or State land.

Table 3.2-8 Land Jurisdiction, Number of Wind Turbines, and Proximity to Bitter Creek East Segment of WSA

Distance from Bitter Creek East Boundary	Land Jurisdiction			
	Federal	State	Private	Total
0.0 - 0.25 mile	7	0	26	33
0.25 - 0.5 mile	6	0	13	19
0.5 - 1.0 mile	11	10	25	46
Total	24	10	64	98

In addition to the wind turbines themselves, lights on the towers may affect solitude. Some portion of the nacelles (215 to 260 feet above the base of the tower) would be equipped with aviation warning lights (flashing red at night) to meet FAA aircraft safety requirements. The specific number and locations of turbines requiring lights would be determined after consulting with the FAA during final design (see Section 2.3.1). It is assumed that potential visual impacts to the WSA associated with night-time warning lights would be no greater than impacts associated with the visibility of the turbines during the day.

Public lands managed by the BLM within the Valley Resource Area are managed for visual resources, and as such, are assigned a VRM class that considers scenic quality, sensitivity to changes in the landscape, and distance (also see Section 3.4 Visual Resources). Surface developments on BLM land must meet the VRM class objectives designated in the RMP. BLM policy is that WSAs are classified as VRM Class I (BLM 2000b). Class I lands are managed to provide primarily for natural ecological changes only; any contrast created within the environment must not attract attention.

Although portions of the wind farm would be seen from the WSA, none of the wind farm facilities would be on lands managed as Class I VRM. The portion of the proposed wind farm on public lands managed by the BLM land would be located on Class IV lands, which would not limit such development.

Section 3.14 Noise and Table 3.14-2 in this EA and the BLM's Final Wind Energy Development PEIS (BLM 2005) discuss the noise levels associated with wind turbines. At a distance of 100 feet from a wind turbine, the typical noise level would be 104 decibels (dB[A]), which is considered very loud. However, noise attenuates rapidly with distance. At 164 feet from a wind turbine, the sound level drops to 62 dB(A), which is about the same as conversational speech at 3 feet. At 2,000 feet downwind from a wind

turbine, the sound level is estimated to be about 40 dB(A), equivalent to background noise levels in a rural environment. Prevailing winds in the area are typically from a westerly direction, which indicates that noise would often be carried away from the WSA. Depending on their arrangement, groups of turbines could produce greater noise than single turbines, but noise levels would not vary by more than 10 dB. Also, according to the BLM's PEIS (BLM 2005), wind-generated background noise tends to increase more rapidly with wind speed than aerodynamic noise from wind turbines. If noise from wind were to increase more than 6 dB(A), the wind turbines would no longer contribute to a perceptible increase in noise.

Approximately one (1) acre of BLM land in the 39,950-acre Bitter Creek East segment would be within 164 feet of the preliminary wind turbine locations (see Table 2.3-1) and approximately 945 acres (2 percent of Bitter Creek East) would be within 2,000 feet of the preliminary turbine locations. Therefore, it is anticipated that noise generated by the proposed wind turbines would have a negligible effect on the wilderness value of solitude in Bitter Creek East.

Operations and maintenance at the wind farm would require 5 to 15 onsite staff, with the number increasing during later phases. The O&M facility would be located about 1 mile from the WSA boundary, but would not be visible from the WSA. Following the initial break-in period, routine service of wind turbines would follow a six-month schedule and unplanned outages would be rare. Relatively few vehicle trips near the WSA would be required for wind turbine maintenance and repair, and these trips would have a negligible effect on the wilderness characteristic of solitude (see Section 2.3.2).

Based on an assessment of wind turbine visibility, wind turbine noise, and traffic, BLM does not believe that the operations and maintenance of the proposed wind farm would change the Bitter Creek WSA's suitability for wilderness designation by Congress.

Should Congress in the future release the Bitter Creek WSA, as the BLM has recommended (BLM 1989), BLM would prepare an ACEC management plan to protect the area. It's designation as an ACEC in 2000 was based on the limited development and roads, and on its properly functioning prairie ecosystem. Lands administered by other agencies and private lands may be located near or within the boundaries of an ACEC, but would not be subject to the ACEC management plan. The presence of wind turbines would not affect the area's designation or management as an ACEC.

Decommissioning Impacts

Low impacts to land use would be anticipated if the VCWEP were decommissioned. Temporary land disturbance of the type and magnitude described for project construction would be anticipated. Upon decommissioning, land use impacts would be largely reversible, and disturbed lands would be restored to their original condition through grading and planting. Once facilities were removed, acreage taken out of cropland and non-irrigated pasture/rangeland use could be returned to these prior uses. Livestock grazing, if occurring at that time, would be abated during the period of decommissioning activities. Local landowners may decide to continue to use and maintain some of the access roads installed by the VCWEP. No permanent land use impacts are expected to result from decommissioning.

Potential recreational impacts from decommissioning, including possible minor and temporary interruption of big game and upland bird hunting, and a minor increase in roadside sightseeing, would be low. Once the site is reclaimed to near pre-project conditions, recreational use in the affected area could resume.

The duration and extent of wind farm impacts on land use can be reduced through implementation of committed mitigation measures 4, 20, 22, 31, 33, 37, 39, 42 and 49, presented in Appendix A.

Transmission Route C

Impacts on land uses and recreation uses could result from various 161/230kV transmission line construction activities including establishment of construction yards and staging areas, surveying, clearing and grading for new access roads, clearing and excavating structure sites, installing structures, removal of obstructions (e.g., vegetation) in right-of-way, and installing conductors. The long-term placement of structures and lines could conflict with existing land uses in and near the proposed right-of-way. In addition, maintenance activities could affect land uses and recreation. Project decommissioning would have impacts similar to those during construction.

Existing Land Use

Dust, noise, and construction-related traffic impacts near residential areas would be considered low because construction-related effects would be temporary and mitigation measures would be implemented as part of construction to minimize these effects. Further discussion of these impacts and measures that would be taken to mitigate them can be found in Sections 3.14 Noise, and 3.15 Air Quality.

During construction, there would be short-term and indirect disturbance to the rural or open space character of some areas. Because of the short duration of construction at any one location, these impacts would be low. No selectively committed mitigation measures are recommended.

Short-term, long-term and direct ground disturbance and disruption of agricultural land (flood irrigated cropland and dryland cultivated cropland), important farmland (Prime Farmland if irrigated and Farmland of Statewide Importance), and non-irrigated pasture/rangeland uses would lead to high, moderate, and low impacts.

Since precise locations for structures, pulling and tensioning sites, staging areas, and access roads have not been identified, assumptions were made about overall land disturbance based on project description information (e.g., number of structures per mile, size of pulling and tensioning sites, size of staging areas, and acreage for new roads) (See Table 2.3-8). Laydown areas for structures and pulling and tensioning sites would temporarily disturb approximately 65.8 acres of mostly rangeland and pasture vegetation. Vegetation would be crushed, but no blading would occur. These sites would be located at points of intersection along Transmission Route C with the total acreage of disturbance potentially changing during final transmission line design. A staging area also would temporarily disturb approximately 10 acres of likely rangeland and pasture vegetation. No specific site has been located for this area as the construction contractor will make this selection. Because these locations have not been specifically identified, it is unknown what type of vegetation would be temporarily disturbed. Areas temporarily disturbed would be allowed to revert to their previous use.

The permanent conversion of 2.7 acres of agricultural land (flood irrigated cropland and dryland cultivated cropland), 67.8 acres of non-irrigated pasture/rangeland, and 0.3 acre of CRP land to utility-related use (i.e., 161/230kV transmission line) would be an unavoidable impact of the use of Route C. In addition, cropping patterns may change around structures located in cropland, which could increase production costs. For this reason, Transmission Route C would avoid cultivated land where feasible and would use un-guyed single pole transmission towers in the Milk River Valley wherever crossing cultivated cropland is necessary. The 2.7 acres of agricultural land (flood irrigated cropland and dryland cultivated cropland) removed from production for the life of the VCWEP represents much less than 1 percent of the total irrigated and non-irrigated harvested cropland (401,000 acres in 2002) in Valley County. The 67.8 acres of non-irrigated pasture/rangeland removed for the life of the VCWEP would have a minimal impact on livestock grazing, given the county's abundance of grazing lands. The 0.3 acre of CRP land removed for the life of the VCWEP represents a very small proportion of the total Valley County land enrolled in the CRP (211,309 acres as of November 16, 2005).

Depending on specific activity, timing and duration, construction activities could disrupt a portion of the planting, growing, irrigation, or harvesting of crops. In addition, soil compaction may occur as a result of construction equipment and activities, necessitating remedial activities to restore agricultural uses.

The loss of productive farmland would result in financial impacts on farmers. Crop values have a wide variation from year to year. Because of this fluctuation, it is not practical to quantify a value per acre for farmland that may be lost or to quantify increased production costs as a result of the 161/230kV transmission line. Land values and production costs are likely to change by the time right-of-way easement acquisitions are pursued. When easement negotiations occur, average values will be calculated.

Placement of transmission line towers in cultivated fields often causes additional time, fertilizer, pesticides, and effort to maneuver agricultural equipment around structures, poles and guy wires. The level of farming difficulty and effort caused by presence of transmission structures depends on the crop, with generally more difficulty for crops with rows that are perpendicular or diagonal to the transmission line, rather than parallel. Potential secondary effects include collisions with poles and damage to farm equipment, restrictions on night-time operations to avoid accidents, restrictions on normal crop rotations because of operational considerations, and increased difficulty in leasing fields with structures. Impacts related to the need for farmers to increase weed and pest control activities around structures also exist.

Impacts on flood irrigation would be minimal as long as fields are re-leveled after construction. Long-term 161/230kV transmission line effects on irrigation practices include interference with canals and ditches at field borders. Within the Glasgow Irrigation District, a Special Use Permit would need to be obtained from the Bureau of Reclamation (BOR) if the final transmission line route would cross BOR-owned lands or would modify BOR ditches and canals. If the final transmission line route crossed ditches and canals for which BOR only has an easement, and if no modifications to the ditches or canals occur, an Acknowledgement of Easement Crossing would need to be obtained from the BOR. The Vandalia South Main Canal, lateral canal V90, lateral canal V63, lateral canal V85, and lateral canal V90 are all crossed by Link 4 of Route C.

The presence of a transmission line can be hazardous to aerial crop spraying operations and typically increases cost to farmers. In addition to the obvious safety hazards, there is a potential for lower effectiveness of aerial spraying and higher costs for materials and aircraft operations (i.e., additional pesticide application around the transmission line).

Impacts to Prime Farmland if irrigated and Farmland of Statewide Importance are primarily from construction activities. Such impacts are considered low because of the short duration of construction, the restoration of agricultural lands to their existing soil types and graded levels, and the resumption of agricultural activities. The provisions of the Federal Farmland Protection Act (FPPA) require evaluation of important farmland status when Federal funds are used for activities that may directly or indirectly convert farmland. Agricultural land along Route C is classified as Prime Farmland if irrigated but is currently not irrigated. Because the transmission line along Route C has the potential to convert Farmland of Statewide Importance to non-agricultural use (Link 4, from milepost 4.1 to milepost 4.4 and from milepost 4.5 to milepost 5.1), a Farmland Conversion Impact Rating for Corridor Type Projects Form (CPA-106) would be completed for Transmission Route C. FSA would determine if the 161/230kV transmission line would have an adverse effect on the participants' CRP acreage. If the FSA determines that the use will have an adverse effect, the affected acreage would be terminated and refunds assessed.

Cattle and other livestock would need to be removed from the most intensive construction areas. In livestock pasture and grazing areas, temporary removal of fencing and gates to provide construction vehicle access could also require restriction of livestock to other fenced areas and could temporarily reduce the amount of land available for grazing. Construction activities could also temporarily disrupt livestock access to supplementary feeding and watering stations. No livestock mortalities, however, are expected as a direct result of construction. Due to the short duration, the construction of the 161/230kV

transmission line is expected to have a low and temporary adverse effect on adjacent livestock grazing. Livestock grazing could continue around the 161/230kV transmission line during operations.

The duration and extent of these impacts can be reduced through implementation of committed mitigation measures 4, 5, 12, 18 to 23, 28, and 32 to 39, presented in Appendix A.

Pipelines. Impacts to pipelines (Northern Border Pipeline and three Williston Basin Interstate Company pipelines) would be reduced through the use of mitigation measures 5 and 20 (Appendix A).

Oil and Gas Leases. Transmission Route C would cross 8.6 miles of authorized Federal leases. Impacts to Federal oil and gas leases would be reduced through the use of mitigation measures 5 and 20 (Appendix A).

Planned Land Use

No identifiable impacts to planned land use were identified. No comprehensive plan, policy or zoning regulation would preclude the siting of the transmission line. To aid in minimizing planned land use impacts, mitigation measure 38 would be implemented (Appendix A).

Parks, Recreation, and Preservation Areas.

Impacts to parks, recreation, and preservation areas include the following:

Recreational Use. Since most of the recreational activity that would be disturbed by the transmission line is dispersed (e.g., wildlife watching, hunting and fishing) disturbance from the transmission line would be minor. Some recreational activities could be diverted during construction, and once again during decommissioning, but would resume once construction or decommissioning have ended. The recreational experience of visitors using adjacent properties during construction could also be affected. Because of the short duration of construction at any one location, these impacts would be low.

It is possible construction-related truck traffic and construction activity could temporarily delay existing access from the east to the WSA and areas outside the WSA for recreational purposes. Impacts to these roads would be short-term. While travel on these roads could be delayed for very short periods by construction activities, access would not be blocked or restricted for long periods. An Access Road Use Plan would be developed to minimize impacts to public use of existing roads in the area. This plan would conform to the requirements of the BLM, State, and local agencies.

Increased Public Access. Construction and maintenance of the 161/230kV transmission line would require the improvement of existing roads and the construction of some new roads into remote areas. This could increase access into areas containing sensitive plant and wildlife communities, cultural resources, and paleontology resources. To aid in minimizing this effect, mitigation measure 4 would be implemented (Appendix A).

Antelope Creek Substation

Existing Land Use

Development of the substation site would result in the permanent conversion to industrial use of 5 acres of non-irrigated pasture/rangeland. The reduction in this land use would have a minimal impact on livestock grazing, given the county's abundance of grazing lands. As such, no adverse impacts would be expected to occur.

Planned Land Use

Currently, no known development plans for the site have been submitted to the Valley County Planning Office. No impacts were identified.

Parks, Recreation, and Preservation Areas

No existing or proposed parks, recreation, and preservation areas exist on or within 0.5 mile of the substation site. No impacts were identified.

Alternative A

Wind Farm and Antelope Creek Substation

Potential impacts from construction and operation of the wind farm and Antelope Creek Substation under Alternative A are the same as those described for the Proposed Action.

Transmission Route A

Existing Land Use

Impacts to existing land use for Transmission Route A would be the same as previously discussed for Transmission Route C except for the differences in temporary and permanent disturbance levels and location of Prime Farmland and Farmland of Statewide Importance (see Appendix F). The same mitigation measures applied to Transmission Route C would apply to Transmission Route A.

Laydown areas for each pole and pulling and tensioning site would temporarily disturb approximately 79.0 acres of vegetation. (see Table 2.3-10).

The permanent conversion of 2.7 acres of agricultural land (flood irrigated cropland and dryland cultivated cropland), 105.8 acres of non-irrigated pasture/rangeland, and 0.3 acre of CRP land to utility-related use (i.e., 161/230kV transmission line) would be an unavoidable impact of the use of Route A. The 2.7 acres of agricultural land removed from production for the life of the transmission line represents much less than 1 percent of the total irrigated and non-irrigated harvested cropland (401,000 acres in 2002) in Valley County. The 105.8 acres of non-irrigated pasture/rangeland removed for the life of the transmission line would have a minimal impact on livestock grazing, given the county's abundance of grazing lands. The 0.3 acre of CRP land removed for the life of the VCWEP represents far less than 1 percent of the total Valley County land enrolled in the CRP (211,309 acres as of November 16, 2005).

Impacts to Prime Farmland if irrigated and Farmland of Statewide Importance are primarily from construction activities. Such impacts are considered low because of the short duration of construction, the restoration of agricultural lands to their existing soil types and graded levels, and the resumption of agricultural activities. Agricultural land along Route A classified as Prime Farmland if irrigated is currently not irrigated. Because the 161/230kV transmission line has the potential to convert Farmland of Statewide Importance to non-agricultural use, a Farmland Conversion Impact Rating for Corridor Type Projects Form (CPA-106) would be completed for Route A. The FSA would determine if the 161/230kV transmission line along Route A would have an adverse effect on the participants' CRP acreage. If so, the affected acreage would be terminated and refunds assessed.

One registered general (commercial) apiary site is crossed by Route A. To aid in minimization of effects, mitigation measure 52 would be implemented (Appendix A).

Link 2 crosses a proposed Dry Prairie Rural Water Supply water distribution line. Impacts would be minimized with mitigation measures 5 and 20 (Appendix A).

Transmission Route A crosses 8.7 miles of authorized Federal oil and gas leases and 6.1 miles of State leases. Impacts to Federal and State oil and gas leases would be reduced through the use of mitigation measures 5 and 20 (Appendix A).

3.3 Transportation

This section presents an assessment of potential traffic and transportation effects associated with construction and operation of the VCWEP. Existing state transportation plans were reviewed to identify pertinent policies, impact evaluation criteria, and planned roadway improvements. Mitigation measures are listed in Appendix A.

3.3.1 Affected Environment

Roads and Highways

The roadway network that could potentially be affected by the VCWEP includes highways and roads. Four classifications, listed below, were used in order to describe the highways and roads in the VCWEP area:

- Federal and State Highways
- Paved Roads
- Improved Roads
- Unimproved Roads

Access to the wind farm site is from Britsch Road from the west and Kerr Road from the east. The first segment of Kerr Road has been upgraded to an all-season gravel road. Kerr Road, a Valley County road, is located in phases III and IV of the proposed wind farm and would be a designated transport route to bring equipment and materials to the site during construction. Most of the improved public roads in the region are graded gravel county roads. U.S. Highway 2, Montana Highway 24, and Montana Secondary 246 also traverse the VCWEP area.

U.S. Highway 2 runs southeast and northwest through the VCWEP area and is part of the National Highway System – Non-Interstate. It is the northernmost U.S. Highway across the continental United States. U.S. Highway 2 is a popular bicycle-touring route during the summer and is listed as one of 11 adventure bicycling routes in the U.S. by the Adventure Bicycle Association. State highways in the VCWEP area include Montana Highway 24 and Montana Secondary 246. Montana Highway 24, part of the State Primary Highway System, runs north-south, while Montana Secondary 246 runs in a southeast and northwest direction.

In addition to the roads described above, there is a network of other public roads (BLM, DNRC, and county) that would be used during construction and operation of the VCWEP. These roads include both maintained and unmaintained roads.

Public lands in the VCWEP area have a road network consisting of designed and constructed routes, two-track roads and prairie trails. Some of these roads or trails were created by users (e.g., ranchers, hunters, and others). These roads provide access to BLM, State, and private lands throughout the study area. Demand for use of these roads is directly related to the resources found on public lands. Roads are needed to maintain access for commercial activities (e.g., livestock grazing, minerals development), non-commercial activities and casual use (e.g., OHV use, hunting, camping, bird watching, recreational driving), and administrative access to manage resources. These roads are single-lane and are of natural material, although gravel has been added in some low-lying areas.

The roadway network that could potentially be affected by the VCWEP also includes highways and roads that are crossed or paralleled by the proposed and alternative transmission line corridors. Transmission Route C would parallel Cornwell Road for nearly 20 miles and U.S. Highway 2 for 0.6 mile. It would also

cross Montana Highway 246 and Billingsley Road. Alternative Route A would roughly parallel Montana Highway 24 for 12 miles and U.S. Highway 2 for 0.6 mile and would cross Highway 2, Highway 246, and Billingsley Road. The Antelope Creek Substation area is served by Billingsley Road, a two-lane graveled and graded county road.

Planned improvements (i.e., gravel) for county roads utilize a priority system. First priority is given to school bus routes followed by main arteries and subsequently other roads. General maintenance on gravel roads includes grading as necessary.

Valley County has no weight restrictions on county roads, except during inclement weather. Large loads currently carried on county roads are primarily hay and cattle. Highways in the vicinity of the VCWEP area are subject to width and length restrictions, as well as weight limitations. Annual permits are needed for large load transport on U.S. Highway 2, Montana Highway 24, and Montana Secondary 246 (exceedence of 8.5-foot width and 75-foot length). Loads that exceed the permitted lengths require single-trip permits from MDOT.

Rail Facilities

The Burlington Northern and Santa Fe (BNSF) railroad (Wolf Point-Havre-Shelby-Libby Main Line) crosses the VCWEP area from east to west. This line is a segment of one of BNSF's principal east-west main lines, which connects the Midwest with the West Coast. The line is a major transcontinental rail freight trunk route. In addition, Amtrak's Empire Builder uses the BNSF route to provide passenger train service between Chicago and Seattle, including service to Glacier National Park.

Air Facilities

Air facilities include public and private airports identified from the FAA, Billings Sectional Aeronautical Chart and Montana Aeronautical Chart. Private airstrips were inventoried, and unidentified private air facilities may exist as part of ranching and farming operations in the VCWEP area. Airports identified in or within the vicinity of the VCWEP area include the public use Wokal Field/Glasgow International Airport and the private use Glasgow Industrial Airport.

Big Sky Airlines operates 2 flights a day at Wokal Field, which has 2 runways and is located 1 mile northeast of Glasgow.

Glasgow Industrial Airport, also known as the Boeing Glasgow Flight Test Facility, is used for airliner flight testing. The facility is maintained and operated by Montana Aviation Research Company (MARCO), a subsidiary of the Boeing Company. This airport is located 15 miles northeast of Glasgow at the former Glasgow Air Force Base at St. Marie.

Private airstrips in or near the VCWEP area include Martin (four landing strips), Billingsley (one landing strip), and Etchart. Martin is located immediately southwest of Tampico, Billingsley is located north of the proposed Antelope Creek Substation approximately 7 miles west of Glasgow, and Etchart is approximately 2 miles northwest of Tampico.

A military operations area (MOA) is airspace designated for military training activities, including aerobatics, air combat tactics, formation training, and other activities. A military training route (MTR) is a series of linked segments of airspace within which various training activities are conducted. Although not required to, military aircraft typically fly an MTR along a defined centerline that governs the plane's height and course. The floor and ceiling for both MOAs and MTRs are defined and the floor may extend down to the earth's surface. The MOA closest to the VCWEP area is the Hays MOA, located 18 miles southwest of Glasgow. The Hays MOA has a floor of 300 feet above ground level (AGL). The MTR closest to the VCWEP area is MTR IR479, 36 miles north of Glasgow.

3.3.2 Environmental Consequences

This section describes the anticipated direct impacts on transportation associated with No Action, the Proposed Action, and Alternative A. Indirect impacts are not anticipated because neither the Proposed Action nor Alternative A is expected to substantially induce regional growth to the extent that the VCWEP would result in significant changes to off-site traffic (see Section 3.5 Socioeconomics and Public Services). On the other hand, an indirect effect could result in increased traffic on Montana Highway 24, Kerr Road, and Britsch Road associated with sightseers curious about the VCWEP. Mitigation measures are largely defined by required permits, including traffic control and safety measures. See Appendix A for traffic- and transportation-related mitigation measures.

No Action Alternative

Under the No Action Alternative, the project would not be constructed or operated, and the environmental impacts described in this section would not occur. Transportation in the VCWEP vicinity would continue without influence of the VCWEP. Roads that would have been improved for the VCWEP would be left unimproved.

Proposed Action

Wind Farm

Project Access

U.S. Highway 2 and Montana Highway 24 would serve as equipment and materials transport routes to Kerr Road and the wind farm site. A newly constructed Valley County gravel-surfaced access road would be required for approximately 2 miles from Kerr Road into the wind farm site. An internal road network would connect the individual turbines. Wind Hunter would construct the internal road system on the wind farm site and would be responsible for maintenance.

The types of heavy equipment required to construct the project would include bulldozers, graders, excavators, front-end loaders, compactors, and dump trucks. Equipment would be moved to the site by flatbed combination truck and would remain onsite for the duration of construction activities. Construction materials hauled to the site would include gravel, sand, and water, which are available locally. Ready-mix concrete, if available, might also be transported to the wind farm site.

Some of the turbine components would be extremely long (e.g., blades) or heavy (e.g., the nacelle containing all drive-train components except the rotor). The size and weight of these components would dictate the specifications for site access roads required rights-of-way, turning radii, and fortified bridges.

There would be no public access to wind farm facilities on privately owned land during construction, operations and maintenance, or decommissioning of the wind farm. Any access provisions for project facilities located on public lands managed by BLM and DNRC would be arranged in coordination with the agencies according to agency guidelines. Appropriate measures to protect public safety would be incorporated in any access provisions for public lands in the wind farm area.

Traffic

It is estimated that during construction and decommissioning, each wind turbine generator would require between 5 and 15 truck shipments of components, some of which could be oversized or overweight. Typically, the transport company would develop a transportation plan based on specific object sizes, weights, origin, destination, and unique handling requirements.

Transportation impacts during operations and maintenance of the wind farm are anticipated to be low. During operations, sites may be attended during business hours by a small maintenance crew of six individuals or fewer. Transportation activities would be limited to a small number of daily trips by pickup trucks or medium-duty vehicles. Large components may be required for equipment replacement in the

event of a major mechanical breakdown. However, such shipments are expected to be infrequent. Traffic generated by the operation of the wind farm is not anticipated to affect the pattern on roadways that are part of the major transport routes for materials and equipment. The wind farm would not alter public roadways except for the primary access road.

Physical Roadway Impacts

Direct transportation impacts include the potential for the project to exceed legal roadway load and weight limits, accident hazards, and degradation of roadway conditions. For the wind farm, the primary concern is the potential transportation-related impacts attributable to vehicle trips (both trucks and automobiles). These trips would be associated with construction, operations and maintenance, and decommissioning of the various project elements.

Overweight permits usually are issued with specific dates during which transport is prohibited. These dates are state-specific but tend to eliminate periods during the spring when frozen ground is thawing. Over-dimension permits are likely to have travel time limits in congested areas, limiting movement to non-rush-hour periods. Depending on the origin and destination sites, shipments of components and main cranes could be made by truck or rail. If rail is utilized, the cargo would require unloading at Glasgow followed by overland transportation to the site by truck.

Hazardous Materials Transport

Hazardous materials to be transported to the site during operation would include lubricating and mineral oils, cleaners, and herbicides in quantities below State and Federal regulatory thresholds. Transportation of these materials would be conducted in a manner that is protective of human health and the environment and in accordance with applicable Federal and MDOT requirements.

No substantial quantities of industrial materials would be brought onto or removed from the wind farm site during project operations. The only materials that would be brought onto the site would be those related to maintenance or replacement of wind farm facilities (e.g., nacelle or turbine components, electrical equipment). The only materials that would be removed from project facilities would be those parts or materials replaced during maintenance activities. The amount of materials removed or replaced would not be significant, except during decommissioning.

Aviation Hazards

The installation of wind turbines on the site may impact air navigation. To provide adequate air traffic safety, the wind turbines will meet FAA safety lighting requirements.

Wind farms could have siting concerns related to the locations of airports and flight patterns and air space associated with the airports because of the turbines. The FAA would be contacted for any proposed construction or alteration of turbines because they would be more than 200 feet tall. The FAA could also recommend marking or lighting a structure that does not exceed 200 feet in height because of its particular location. The exact number of turbines that would require lighting will be specified by the FAA after it has reviewed final project plans for each phase of development.

Navigation concerns also exist where tall structures are located in or near MOAs and MTRS because wind turbines can intrude upon these airspaces if not located properly. No MOAs or MTRs are located near the wind farm area.

Transmission Route C

Construction of Transmission Route C could potentially affect traffic flow on public highways and roads as the 230kV transmission line is built across each of the roadways. Therefore, it would be necessary for Wind Hunter to obtain encroachment permits or similar legal agreements from the public agencies responsible for each affected roadway. Such permits are needed for roads that would be crossed by the

transmission line, as well as for the parallel roads where transmission line construction activities would require the use of the public right-of-way (e.g., temporary lane closures). These encroachment permits would be issued by the MDOT, Glendive District, or Valley County.

Direct and indirect impacts could include minor increases in traffic, possible detours along some roads, and minor disrupted access to driveways for short periods during construction. Construction of the transmission line is not expected to cause major traffic delays or road closures. Minor traffic delays or interference with the highway system would likely result from construction activities, but construction should not cause temporary closure of main highways. Users of smaller roads may experience minor delays. Wind Hunter would work closely with MDOT and Valley County so that crossings are properly posted and detours provided where necessary.

Impacts associated with the transmission line would be short-term and related to the movement of personnel and equipment during construction. Traffic associated with operations would be a limited number of vehicle trips during routine inspection and maintenance activities. Transmission line inspection and maintenance traffic would occur infrequently, and would not involve large numbers of vehicles or workers.

Antelope Creek Substation

Construction activities would temporarily generate a small increase in vehicular movement over the six-to-eight-month construction period, and may alter circulation patterns and increase traffic hazards on local roads for a short period. During operations, traffic impacts in the vicinity of the Antelope Creek Substation would be minimal. Provisions in Western's Construction Standards (Standard 1, General Requirements) address traffic control and safety issues. With implementation of these provisions, impacts would be minimal.

Alternative A

Potential traffic- and transportation-related impacts under Alternative A would be similar to those addressed for the Proposed Action. As with Transmission Route C, construction of Transmission Route A would require Wind Hunter to obtain encroachment permits or similar legal requirements from the public agencies (i.e., MDOT, Valley County) responsible for each affected roadway that would have to be crossed or that would require temporary lane closures.

3.4. Visual Resources

Because a significant amount of BLM land is within the VCWEP study area, the Visual Resource Management (VRM) system used by the BLM guided the visual analysis for this EA and provides a framework for study.

The BLM system uses two methods to inventory and evaluate existing visual resources on public lands:

- BLM Manual H-8410-1: Visual Resource Inventory (BLM 1986a) is used for inventorying existing visual quality, determining viewer sensitivity, and determining visibility for the purposes of setting VRM Classes on public lands, and
- BLM Manual 8431: Visual Resource Contrast Rating (BLM 1986b) is used to determine the extent management activities will conform to classes identified in Manual H-8410-1.

VRM Classes are established in the Final Judith Valley Phillips RMP/EIS (BLM 1992). Visual resources methods and principles established in Manual H-8410-1 were used in this EA to determine visual quality, sensitivity and visibility over the project area. They were not used for VRM classification, but as a baseline and aid in the evaluation of scenic quality and viewer impacts as determined by contrast rating, using methods similar to those in Manual H-8410-1.

Similar methods and conclusions from studies in the MFSA Application (POWER Engineers 2004) were carried forward or revised as appropriate for this EA. Describing the affected environment and identifying environmental consequences for the project area included the following steps:

- Inventory of Existing Regional Landform, Vegetation and Water Features
- Development of Landscape Rating Units
- Inventory of Scenic Quality and Visual Integrity within Landscape Rating Units
- Visual Sensitivity Analysis
- Determining Distance Zones and Visual Influence Zones
- Visual Contrast Analysis
- Impact Assessment
- Mitigation Planning

3.4.1 Affected Environment

Landscape Character

The VCWEP study area lies within the glaciated Missouri Plateau section of the Great Plains physiographic province in the Interior Plains. Valley deposition and old plateau smoothing as a result of glaciation were major influences on landform development, which is typically characterized by the dominance of rolling, terrace-like plains. These plains have broadly terraced river valleys and large interstream uplands that include highly dissected badlands (Fennemen 1931). The badlands generally have highly erodible soils, sparsely vegetated and steep hillsides, and deeply incised drainages. The erosive forces of glacial outwash cut somewhat deeply eroded drainages, or coulees. The Milk River floodplain, an important landscape feature, was formed by the pre-glacial path of the Missouri River.

Cultural modifications are generally concentrated toward the south end of the VCWEP, and include the town of Glasgow, dispersed rural residences and agricultural facilities, agricultural lands, airstrips, backcountry jeep trails, and several highways and other roads. The concentration of dwellings generally decreases as a function of distance from Glasgow. There are two major travel routes within the study area. U.S. Highway 2 is the primary east - west corridor and is in the southern portion of the study area, and Montana Highway 24 serves as the primary north - south road. Minor roads include Britsch Road, Kerr Road, Vandalia Road, Riverside Drive, and Jensen Trail. Grazing and agricultural activities occur throughout the study area, with agricultural activities concentrated adjacent to the major and minor roads and in the Milk River floodplain.

Landscape Rating Units

Landscapes in the VCWEP area can be assigned to landscape rating units based on cultural modification, landform, vegetation, and general character. The landscape rating units used for this EA are summarized below.

Natural Rolling Plains

This unit consists of low, open rolling hills having only slight relief. Vegetation consists mainly of a fairly uniform ground cover of prairie grasses. These grasses provide a fine greenish-yellow colored texture to the landscape. There is generally not much diversity in landscape colors or textures, and linear elements are typically confined to the strong horizontal ridgeline that distinctly separates sky from landform. This unit is fairly common to the region. Cultural features are generally limited to fence lines, two-track and paved roadways and trails, culverts, and occasional cattle ponds that are typically less than a few acres in

size. Occasional wildlife may add to the visual quality of the unit. Uniformity, monotony, and simplicity are the dominant attributes of this unit.

Natural Coulee

This unit is located throughout the study area along the Milk River's perennial and intermittent tributaries. The landform structure is typified by flat-bottomed valleys enclosed by somewhat steep hillsides. A somewhat strong, horizontal ridgeline contrasts with the verticality of tree trunks. Landscape elements are varied, with open water in streams occasionally being present. The relative abundance of trees and understory shrubs adds a somewhat coarse texture to the overall landscape. These randomly patterned clumps of trees and sparse clumps of lower growing shrubs provide some variety and diversity in landscape colors and textures. Colors vary from earth-tone browns, tans, and grays to yellows and dark greens. There is a balance of textures ranging from the coarseness provided by tree trunks, limbs, and foliage, through the moderately fine understory shrubs, to the finer ground cover vegetation. Cultural modifications are almost exclusively limited to two-track trails and are not often apparent.

Badlands

This rating unit is typically found inside the Bitter Creek WSA and has a more diverse general character associated with it. This landform is more defined than other units, with eroded terrain exposing underlying soils, and buttes or pinnacles providing variation in topography. Eroded rivulets add intricate texture to the landscape. The steep hillsides also provide more opportunity for shade and shadows. Vegetation is irregular and patchy, often absent, and the variety of colors from soils and vegetation adds interest. This unit is fairly uncommon in the region. Cultural modifications are almost exclusively limited to two-track trails where topography allows, and are not often apparent.

Rural Developed Plains

Located in rural outlying areas, this unit is typically agricultural in nature, with architectural elements limited to occasional homes, grain bins, or isolated commercial and institutional buildings. The low, open landscape is similar to the rolling plains unit, but often with a coarser texture and large, regular patches of yellow, tan, or exposed brown soil patches due to the dominance of cultivated crops. Existing roadways, fence lines, agricultural field interfaces, and electric transmission poles and lines provide additional linear elements. Architectural elements are typically clustered in large, blocky masses. There is generally little harmony in architectural features, elements, and colors.

Rural Developed Coulee

This unit is located in the bottomlands of the Milk River tributary streams where the landscape is defined by fairly steep ravine slopes enclosing a valley and where agricultural activities dominate. The unit is similar to the Natural Coulee unit in spatial enclosure and dominant landforms. Tree cover is typically present and adds coarseness in texture and linear elements to the landscape. The understory is most often cleared out to allow grazing. Architectural elements are typically variable, diverse, and un-unified. Color structure is large and blocky, with fairly uniform large blocks of hay fields or cultivated cover. Hay rolls are often present after harvest, regularly punctuating the fields with circular elements that add interest and continuity to the landscape.

Agricultural Floodplain

This rating unit is the open, flat Milk River floodplain that is typically dominated by agricultural activities, roadways, railroad corridors, and scattered residential and agriculture-related structures. These elements often provide a strong linear quality to the landscape, especially along Tampico Road. There is little harmony in architectural features, elements, and colors, and more highly developed areas and land uses may have little relationship to each other. As with the Rural Developed Plains unit, there are many large, uniform patches of various colors and textures. This unit has almost no vertical relief.

Milk River Corridor

This unit is located within the Agricultural Floodplain unit, and is a thin ribbon of mature riparian overstory (cottonwood) and associated deeply incised, open water river channel. Some cultural features such as barns, houses and pasture, are present, but visual character is dominated by the natural forest and the Milk River. The understory layer is variable depending on moisture regime and grazing activities. Compared to the width of the overall floodplain, from 3 to 5 miles, this riparian area is relatively narrow.

Scenic Quality and Visual Integrity

Two similar methods (the Scenic Quality Method and the Visual Integrity Method) were used to rate scenic quality in the study area. The BLM's Scenic Quality method is used for natural landscapes. Because agricultural and urbanized lands are not addressed by the BLM system, these areas were evaluated using similar Visual Integrity criteria developed for the VCWEP MFSA Application (POWER Engineers 2004).

The landscape rating units discussed above are assigned to a Scenic Quality/Visual Integrity class based on landform, water, vegetation and structure form, line color and texture. All units in the VCWEP area are assigned either to Scenic Quality/Visual Integrity Class B (above average) or to Class C (common). There are no Scenic Quality/Visual Integrity Class A (unique) landscapes in the VCWEP area.

Most of the region is classified as Class C (common) Scenic Quality/Visual Integrity. The Milk River Valley and major drainages in the region are classified as Class B (above average). Class B drainages include Spring Creek, Cherry Creek, Buggy Creek, Unger Coulee, Bear Creek, Black Coulee, Alkali Creek, and Antelope Creek (Figure 3.4-1).

Visual Sensitivity

The visual sensitivity analysis has three components: 1) assessing views from sensitive points; 2) assessing the visual sensitivity of these points; and 3) identifying seen areas/visibility thresholds.

Potential critical viewpoints that may have views of the proposed VCWEP were identified and inventoried. Typically, these include recreation areas, travel routes, and residences, but can vary with the cultural context of the proposed project. For the VCWEP, all roads, recreation areas, occupied residences, and similar locations were identified and assessed using land use data and a site reconnaissance.

In the MFSA Application (POWER Engineers 2004), two levels of visual sensitivity were assigned to viewpoints in the area. Key Observation Points (KOPs) were identified along sensitive travel corridors, in parks and recreation areas, and at overlooks where the most critical potential views for the VCWEP were expected. A high sensitivity level was assigned to all occupied residences, Faraasen Park, the Bitter Creek WSA Wildlife Viewing Area and destination route, and the Buffalo Country Interpretive Site. A moderate sensitivity level was assigned to Montana Highway 24, U.S. Highway 2, Glasgow Base Ponds fishing access site and destination route, and Faraasen Park destination route along Montana Secondary 246 (Figure 3.4-2).

Figure 3.4-1 Typical Scenic Quality Classes

Typical Class B Scenery-Natural	**Typical Class B Scenery: Cultural**
Typical Class C Scenery-Natural	**Typical Class C Scenery: Cultural**

VRM Classes

The BLM manages activities on its lands to comply with the Visual Resource Management (VRM) policy. With increased interest in tourism, sightseeing, backcountry byways, scenic corridors and scenic overlooks, the BLM places management emphasis on maintaining scenic quality within the overall multiple-use management direction. VRM classes guide development activities, with each class having a management objective that prescribes the level of acceptable change in the landscape. These classes are defined as follows (BLM 1986a):

> **Class I -** This class provides primarily for natural ecological changes only; however, it does not preclude very limited activity. Any contrast created within the characteristic environment must not attract attention.
>
> **Class II -** The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.

Class III - Contrasts to the basic elements caused by a management activity may be evident and begin to attract attention in the characteristic landscape. However, the changes should remain subordinate to the existing characteristic landscape.

Class IV - Contrasts may attract attention and be a dominant feature in the landscape in terms of scale; however, the change should repeat the basic elements inherent in the characteristic landscape.

The visual contrast rating system is used as a guide for all major projects proposed on BLM lands that fall within VRM Classes I, II, and III. However, VRM class objectives may not always be met due to non-discretionary actions or exceptions that occur after evaluation and at the discretion of the Authorized Officer (J. Collins, personal communication 2006). BLM land within the Valley Resource Area has been assigned VRM classes based on scenic quality, sensitivity to changes in the landscape, and distance. Surface developments are designed or mitigated to complement and harmonize with the natural features and the VRM class objectives.

VRM classes for BLM lands in the VCWEP area were identified from maps in the Final Judith Valley Phillips RMP/EIS (BLM 1992). VRM classes established by the BLM in the VCWEP study area include Class II, III and IV. Class II lands in the VCWEP area are landscapes that provide contrast to the uniformity of the surrounding plains, and are located primarily in the Bitter Creek WSA. Isolated Class II parcels exist elsewhere in the VCWEP area and include major stream valleys and breaks along some deeply incised valleys. Most of the BLM-administered lands in the VCWEP area are managed under VRM Class IV.

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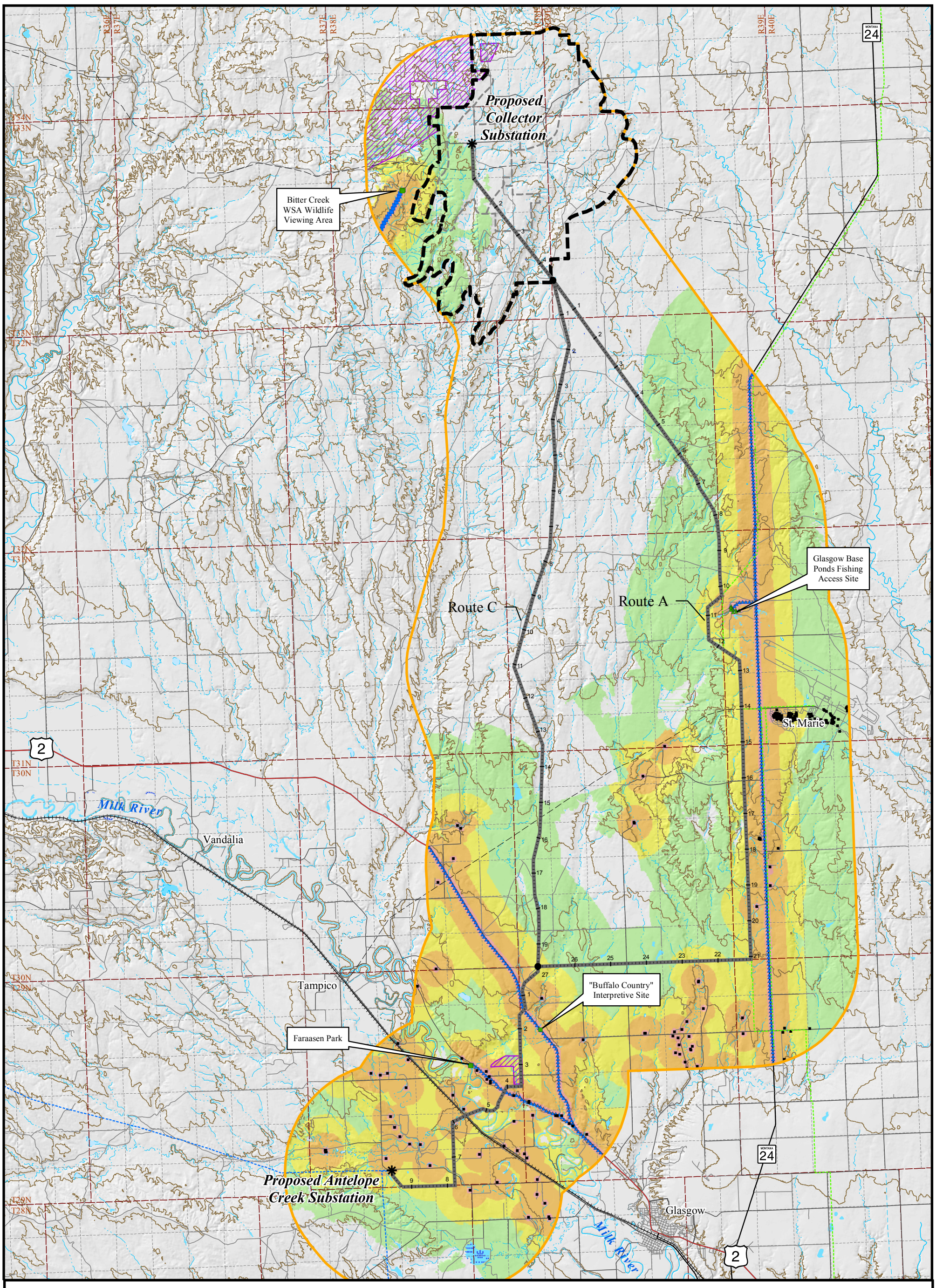

Legend

- Alternative Transmission Route
- Mile Markers
- Tenth Mile Marker
- Link Node
- 500 MW Wind Project Area
- Wind Farm Phase Divider
- Study Area
- US Highway
- State Highway
- Paved Arterial Road
- Gravel or Graded Arterial Road
- Local or Minor Road
- Railroad
- 230kV Transmission Line Energized at 161kV
- Other Transmission Line
- Pipeline
- Township Line
- Section Line
- Index Contour (100' Interval)
- River or Stream
- Intermittent Stream
- Canal
- Lake or Pond
- Intermittent Pond
- Swamp or Marsh
- Proposed Substation
- Home or Residence
- High Sensitivity Road Viewer
- Moderate Sensitivity Road Viewer
- High Sensitivity Recreation Viewer
- Moderate Sensitivity Recreation Viewer
- BLM VRM Class II
- Immediate Foreground Visibility (0 to 500 Feet)
- Foreground Visbility (500 Feet to 1/2 Mile)
- Middleground Visibility (1/2 Mile to 1 Mile)
- Background Visibility (1 Mile to 3 Miles)

VALLEY COUNTY WIND ENERGY PROJECT

Figure 3.4-2

Visual Resources

0 0.5 1 2 3 4 5 6

Miles

1:158,400 or 1" = 2.5 Miles

POWER ENGINEERS

Print Date : April 28, 2006

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3.4.2 Environmental Consequences

Distance Zones/Visual Influence Zones

Distance zones were established based upon perception thresholds, the scale and nature of the objects being viewed, and the viewing environment. The perception of form, texture, color and other visual elements in the landscape is a function of changing distance from a viewpoint. In general, landscape elements tend to become less obvious and less detailed at greater distances. Elements of form and line become more dominant than color or texture at longer viewing distances. For this EA, a review of previous studies in similar geographical, topographical, and environmental settings was performed, and relevant visibility thresholds were established for project components and environments.

Five distance zones for the wind farm were used:

- Immediate Foreground: 0 - 1.5 miles
- Foreground: 1.5 - 4.0 miles
- Middleground: 4.0 - 10.0 miles
- Background: 10.0 - 18.0 miles
- Seldom Seen: Beyond 18.0 miles

For transmission lines and the substation, the following distance zones were used:

- Immediate Foreground: 0 - 500 feet
- Foreground: 500 feet - 0.5 mile
- Middleground: 0.5 - 1.0 mile
- Background: 1.0 - 3.0 miles
- Seldom Seen: Beyond 3.0 miles

Distances zones for the wind farm and transmission lines differ because wind turbines, 330 to 390 feet high, are from three to six times taller than transmission structures or poles, 65 to 100 feet high (see Tables 2.3-2 and 2.3-7).

Evaluating impacts to visual resources involves the identification of sensitive viewers within visual influence zones (Figure 3.4-3). Visual influence zones are similar to distance zones, discussed above, but the latter are from the perspective of the viewer while the former are from the perspective of the object viewed. Visual influence zones are rated as Very High, High, Moderate, and Low. Visual influence zones were identified by using distance zones to assess the visibility of VCWEP components (e.g., wind turbines, transmission line).

For the wind farm, an analysis was conducted using Geographic Information Systems (GIS) to determine the area of visual influence. Using the visual influence zones shown in Figure 3.4-3, sensitive viewers were identified within an 18-mile radius of the wind farm, and potential impacts analyzed for each wind farm development phase.

The analysis was refined though viewshed mapping to focus on the most highly impacted viewers at the closest viewpoints. To determine impact levels, distance from sensitive viewpoints (i.e., distance zone) was compared to sensitivity and contrast. Potential impacts to Scenic Quality/Visual Integrity were based on the change in quality and quantity of the visual resources inherent in the landscape without regard to how the resources were seen from viewpoints.

The driving factor in assessing the impacts of the wind farm on sensitive viewers is the scale and structure contrast of the turbine and massing of turbine strings. It was assumed that there would be a high overall contrast due to turbine numbers and size and the lack of significant existing development. Therefore, it was also assumed that structure contrast would be the dominant visually contrasting element, rather than vegetation or landform. After determining the final visual contrast, the potential for visual impacts on recreational viewers, travel routes, and scenic quality was assessed.

A number of assumptions are used for the assessment of visual impacts associated with the construction of the transmission lines. One important component of the contrast analysis is ground disturbance. Ground disturbance levels (1 through 5) address the level of expected new road construction, associated spur road mileage, and slope (POWER Engineers 2004).

New roads and improved existing roads would be necessary in some locations along the transmission lines (see Tables 2.3-8 and 2.3-10). New access roads would be revegetated following construction, but the road prisms would remain intact for access during routine patrols and maintenance.

Visual contrast is made up of three separate contrast models: Landform, Vegetation, and Structure. The impact model utilized these three contrast models to provide a final contrast level, which was then used to determine impact levels.

Strong Visual Contrast

- Landform: Contrast caused by construction of new access roads in steep terrain where soils are potentially erosive;
- Vegetation: The removal of dense riparian vegetation for rights-of-way, tower sites, or access roads; or
- Structure: A landscape with no existing transmission lines.

Moderate Visual Contrast

- Landform: Contrasts caused by blading existing access roads in areas of moderate soil erosion potential;
- Vegetation: Removal of grassland or agricultural vegetation from rights-of-way; or
- Structure: A landscape where existing but stylistically different transmission line facilities would be nearby or paralleled.

Weak Visual Contrast

- Landform: Contrasts caused by the use of unimproved existing roads where improvements are needed and there is limited new spur road construction in areas where soils have low erosion potential;
- Vegetation: Minimal removal of vegetation; or
- Structure: A landscape where existing, similar transmission line facilities would be nearby or parallel.

Impacts on residential, recreation, and road viewers were dependent on sensitivity level (e.g., moderate or high), final contrast levels, and viewing condition (e.g., immediate foreground, foreground, middleground, background). Scenic quality impacts were based on Scenic Quality/Visual Integrity Class (B or C) and overall contrast level. Mitigation measures and impact modifiers (e.g., viewer orientation, use level, development level) were evaluated for potential effectiveness, and an impact level was assigned. The total mileage along a transmission route for each impact level was then calculated.

Figure 3.4-3 Wind Farm Visual Influence

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Impact Criteria

Visual and Scenic Quality impact levels are classified as High, Moderate, and Low. Impacts can vary from no change or only slightly discernible change to a full modification of the environment.

In order to determine impact intensity, impact criteria were developed utilizing visual sensitivity, visual contrast (i.e., vegetation, landform, and structure), distance, and scenic quality. Using the impact assessment and mitigation planning process, the predicted effects of the VCWEP were compared with the existing environment to determine initial impacts on visual resources. The result was the following impact levels:

High Impact - A high level of impact would result if the construction, operation, maintenance, or abandonment of the VCWEP would potentially cause substantial adverse change to sensitive viewers and scenic quality in terms of form, line, color, or texture.

Moderate Impact - A moderate level of impact would result if the construction, operation, maintenance, or abandonment of the VCWEP would potentially cause some adverse change to sensitive viewers and scenic quality in terms of form, line, color, and texture.

Low Impact - A low level of impact would result if the construction, operation, maintenance, or abandonment of the VCWEP would potentially cause a small adverse change to sensitive viewers and scenic quality in terms of form, line, color, and texture.

No Action

Under the No Action Alternative, the visual setting in the VCWEP vicinity would continue without influence of the proposed wind farm, transmission line, or substation.

Proposed Action

Wind Farm

The analysis showed that very few sensitive receptors are located in visual influence zones in which high visual impacts would occur. Visibility of the wind farm is detailed in Table 3.4-1. Visual simulation locations are shown on Figure 3.4-4.

There are a variety of potential visual impacts related to construction, operation, and maintenance of the wind farm that are applicable to all phases of development. These may have an impact on sensitive viewers or scenic quality, and include constructing new roads and upgrading existing roads for access, ground disturbance at turbine sites, turbine assembly and erection, construction and related traffic, auxiliary installation, installation of additional MET towers, soil exposure and dust, glare of reflected sunlight, lights associated with site security and air traffic safety, multiple and overlapping blade rotation causing disconcerting visual patterns, upgrade and replacement of turbines, and changes related to decommissioning.

Night-time red or white flashing lights would cause impacts to viewers. Though the wind farm would be in background view for most sensitive viewers, the lack of any existing lights in the wind farm area would provide a high contrast to the night sky. The only nearby sensitive receptors highly impacted by red flashing lights would be in the Bitter Creek WSA and destination route. Dispersed recreation users (e.g., fishing, hunting and camping) would be affected, but are not included in the impact model due to the difficulty of predicting location, attitudes, orientation and other highly variable factors.

Table 3.4-1 Wind Farm Visibility and Distance Zones

Distance Zone/ Visual Influence Zone	Number of Visible Turbines				
	Phase I	Phase II	Phase III	Phase IV	Full Build-out
Immediate Foreground (0-1.5 miles)	11	10	0	1	22
Foreground (1.5-4.0 miles)	18	53	15	66	152
Middleground (4.0-10.0 miles)	4	0	89	67	160
Background (10.0-18.0 miles)	0	0	0	0	0
Total	33	63	104	134	334

Light and glare from the wind turbines and associated facilities would be produced. Increased light levels produced by facility security lighting may be a factor due to the contrast created against the night sky. Glare produced by various surfaces has the potential to affect the visual environment to varying degrees based on finishing material and surface treatment.

Decommissioning impacts would be similar to construction impacts with the presence of equipment and associated traffic. Though the towers would be removed, portions of turbine foundations would remain in place and buried. Temporary landform contrasts would result until exposed soils and fill areas are established with vegetation.

Visual impacts of the wind farm would be additive, with subsequent phases adding to visual contrasts already present in earlier phases (Table 3.4-2).

Although the Wind Energy Development PEIS and ROD (BLM 2005) amended the Judith Valley Phillips RMP to allow for wind energy development, the PEIS and ROD did not change agency visual objectives or the impact levels for scenic quality and sensitive viewers potentially affected by the Proposed Action.

Phase I

For Phase I, a total of 29 towers would be in the Foreground or Immediate Foreground viewing distances from the Bitter Creek WSA wildlife viewing area and Britsch Road. Four towers would be in Middleground viewing condition.

For Phase I, the effects on sensitive receptors would be limited. The highest impacts would be from the Bitter Creek WSA Wildlife Viewing Area and destination route, where users would experience the towers as close as 3,550 feet (0.7 mile). At this range, the towers would be a dominant part of the landscape. Phase I would include one short turbine string and one long turbine string. Overall, Phase I would have moderate Scenic Quality and high impacts to viewers traveling on Britsch Road or visiting the adjacent Bitter Creek WSA Wildlife Viewing Area. Visibility and impacts are based on preliminary site planning and string layout.

Two hundred fifty-nine (259) acres of BLM VRM Class IV and 2.16 acres of VRM Class II lands would be located in the Phase I area. No towers would be placed on the Class II lands.

Table 3.4-2 Visual Impacts of Wind Farm Turbines (Cumulative)

Wind Farm Phase	Number of Turbines		
	Total	High Visual Impacts	Moderate Visual Impacts
Phase I	33	29	4
Phases I-II	96	92	4
Phases I-III	200	107	93
Phases I-IV (Full Build-out)	334	174	160

Phase II

A total of 63 towers would be in the Foreground or Immediate Foreground viewing distances from the Bitter Creek WSA Wildlife Viewing Area and Britsch Road for Phase II. No towers would be in Middleground viewing condition. For Phases I and II combined, a total of 92 towers would be in Foreground or Immediate Foreground viewing condition, while four would be in the Middleground. As viewed from the Bitter Creek WSA, Phase II would create more of a massing affect, with Phase I towers typically in the Foreground of the Phase II towers with the exception of the Phase II towers being viewed from Britsch Road.

Phase II includes 1,050 acres of BLM Class IV lands.

Phase III

A total of 15 towers would be in the Foreground or Immediate Foreground viewing distances from the Bitter Creek WSA Wildlife Viewing Area and Britsch Road for Phase I. A total of 89 towers would be in Middleground viewing condition. For Phases I, II and III combined, a total of 107 towers would be in Foreground or Immediate Foreground viewing condition, while 93 would be in the Middleground (Table 3.4-2). The highest impacts of Phase III would be those caused by the expansion of the wind farm into the northern viewshed from the Bitter Creek WSA. The southern portion of this phase would not appreciably add to contrasts because of the relatively small number of new towers.

VRM lands for Phase III amount to 2,181 acres of Class IV lands and 126 acres of Class II lands. No towers would be built on Class II lands.

Phase IV

A total of 67 towers would be in the Foreground or Immediate Foreground viewing distances from the Bitter Creek WSA Wildlife Viewing Area and Britsch Road for Phase IV. A total of 67 towers would be in Middleground viewing condition. For Phases I, II, III and VI combined, a total of 174 towers would be in Foreground or Immediate Foreground viewing condition, while 160 would be in the Middleground. As with Phase III, this phase would extend tower visibility across the viewshed of sensitive viewers, but would more directly affect the Bitter Creek WSA Wildlife Viewing Area viewers and those traveling north on Britsch Road.

BLM Class IV lands in this phase amount to 7,661 acres.

Full Build-out

At full build-out, the highest visual impact of the wind farm would be from the Bitter Creek WSA Wildlife Viewing Area and destination route. One hundred and seventy-four (174) turbines would be highly visible from the Bitter Creek WSA Wildlife Viewing Area. A visual simulation of the wind farm at full build-out from the Bitter Creek WSA Wildlife Viewing Area is shown in Figure 3.4-5.

Other sensitive viewers within 18 miles would include those at outlying residences, at Glasgow Base Ponds Fishing Access Site, and along Montana Highway 24. Overall visual impacts on occupied residences would be low. Of the 366 residences within 18 miles, 137 are located in St. Marie and would have obstructed views of the wind farm. Only 24 residences would be within 10 miles of the wind farm at full build-out, and all of these would be more than 5 miles from the wind farm.

The final build-out of the project would include approximately 128 acres of VRM Class II lands and 11,151 acres of VRM Class IV lands. Class II lands are located in both Phases I and III. However, any disturbance that occurs would conform to Class II objectives during final design and construction. No turbine, permanent road, or ancillary structure would be constructed on Class II lands.

Transmission Route C

There are a variety of potential visual impacts on sensitive viewers or Scenic Quality related to the construction, operation, and maintenance of the transmission lines. These include:

- Construction of new roads and upgrading existing roads for access.
- Ground disturbance at transmission structure sites.
- Transmission structure assembly and erection.
- Construction and related traffic.
- Soil exposure and dust.
- Transmission structure contrast and impacts on natural landscapes.

Of these, the effects of structure contrast and modification of natural landscapes and Scenic Quality are expected to be most important.

The extreme northern portion of Transmission Route C would be within 3 miles of the Bitter Creek WSA overlook, but at this distance the transmission line would cause low impacts. The route would cross U.S. Highway 2 and Riverside Drive. Residences in a few locations would have Transmission Route C in Foreground views. Also, the Buffalo Country Interpretive Site would have a portion of Route C in Middleground view.

Overall, high-sensitivity residential viewers would see the transmission line along Route C in Immediate Foreground and Foreground viewing condition for 3.4 miles of the alignment, high sensitivity recreational viewers would see the project in Middleground viewing condition for over 1.9 miles, and 3.4 miles would be in Immediate Foreground and Foreground viewing condition for moderate sensitivity travel corridor viewers. A total of 6.8 miles of the route would be in Immediate Foreground and Foreground views of residential, recreational, or travel corridor viewers of moderate and high sensitivity (Table 3.4-3).

Table 3.4-3 Transmission Line Visibility and Distance Zones

	Viewer Sensitivity and Viewer Type (miles)			
	High		Moderate	
Distance Zone	Residential	Recreation	Travel Corridor	Recreation
Transmission Route A				
Immediate Foreground (0-500 feet)	0.6	0.0	1.1	0.0
Foreground (500 feet-0.5 mile)	3.8	0.0	4.1	0.5
Middleground (0.5-1.0 mile)	10.2	1.9	12.9	1.6
Transmission Route C				
Immediate Foreground (0-500 feet)	0.6	0.0	1.1	0.0
Foreground (500 feet-0.5 mile)	2.8	0.0	2.3	0.0
Middleground (0.5-1.0 mile)	4.8	1.9	2.5	0.0

As Transmission Route C crosses Riverside Drive and enters the Milk River floodplain, the transmission structures would transition from H-frame wood structures approximately 65 to 75 feet high to single corten steel poles approximately 90 to 100 feet in height and spaced 150 feet closer than the H-frame structures. Sensitive viewers in this area would include a few residences on Riverside Drive and Montana Secondary 246, as well as visitors to Faraasen Park (Riverside Drive). Other nearby residences are located along Billingsley Road. Contrasts resulting from ground disturbance and vegetation clearing would be similar to that for H-frame structures, as would short-term construction-related impacts. Structure contrasts may be slightly higher immediately after installation until the steel poles oxidize to a rust brown color.

Short-term visual impacts would result from the presence of construction equipment such as cranes, trucks, traffic, and soil exposure/dust.

Transmission Route C would have approximately 4.3 miles of high visual impact and 11.1 miles of moderate visual impact. See Figure 3.4-6 for a visual simulation of the crossing of U.S. Highway 2 by Transmission Route C.

VRM Class II BLM lands would be crossed by Route C between milepost 2.7 and 3.6 (Link 4). Avoidance would require crossing private land.

Antelope Creek Substation

When completed, the Antelope Creek Substation would be similar in form, color, and scale to the existing Richardson Coulee Substation to the immediate west. Because all of the existing vegetation on the 5-acre

site would be removed, vegetation contrast would be high. The existing landform is generally flat, as would be the proposed substation, so landform contrast would be low.

Short-term construction-related impacts would occur. High initial visual impacts were determined for one residence that would have Foreground views of the Antelope Creek Substation. Moderate impact levels were determined for three residences that would have the substation in Middleground view. There would be no visual impacts to recreation viewers. Western's standard construction provisions (Standard 13, June 2003) (Appendix G) would require reseeding.

Alternative A

Wind Farm and Substation

Under Alternative A, impacts associated with wind farm and substation construction, operation, maintenance, and decommissioning would be identical to those discussed for the Proposed Action.

Transmission Route A

The highest visibility of Transmission Route A would be for Highway 24 viewers, Glasgow Base Pond viewers, and concentrations of residences near Skylark Road and the Jensen Trail/U.S. Highway 2 intersection. Residences in St. Marie would have blocked views of Route A. The impact levels for this route indicate a higher level of visual impact compared to Route C, with 5.6 miles of high visual impacts and 15.3 miles of moderate visual impacts expected.

As with Transmission Route C, VRM Class II BLM lands would be crossed by Route A. Avoidance would require crossing private land.

Transmission Route A does not differ from Route C in the use of single corten steel structures in agricultural lands and the Milk River floodplain, as Route A has Link 4 in common with Route C.

Cultural Resources

The visual setting may be an important characteristic of some cultural resources. For example, rock art sites, certain types of historic buildings, traditional cultural properties, and cultural landscapes could be determined eligible to the National Register of Historic Places (NHRP) in part because of the scenic qualities of the surrounding environment. For more on visual issues for cultural landscapes and other cultural resources, see Section 3.12.

Mitigation Planning

Mitigation measures will be implemented where high visual impacts are expected. For both the wind farm and transmission line, there are several measures that can be implemented for specific expected impacts. Many of the impacts, however, such as Scenic Quality impacts, would be unavoidable and no mitigation method would significantly reduce them.

Those impacts that can be mitigated for the wind farm portion of the project would be:

- Impacts associated with potential tower glare, reflected sunlight and color contrast would be mitigated by painting the turbines and accessory structures non-reflective neutral gray or earth-tone color to be visually less obtrusive. Uncoated galvanized metallic surfaces that would result in prolonged and strong visual contrast would not be used.

- Safety lighting impacts would be mitigated by the use of nighttime and motion sensor lights. Sensors and switches would be used to keep lights off when not required. Emergency lighting

with back-up power would be included to allow personnel to perform manual operations during an outage of normal power sources.

- To reduce contrasts created in the night sky by FAA-required aviation warning lights, a synchronized system would be installed.

For the transmission line portion of the project, the following mitigation measures would be implemented:

- For contrasts related to project construction, all construction vehicle movement outside the right-of-way normally would be restricted to pre-designated access or public roads.

- For site disturbance, landform and vegetation contrasts, exposed soils would be reclaimed using weed-free native grasses, forbs, and shrubs. Reclamation of disturbed areas would be undertaken as early as possible after construction.

- In construction areas (e.g., marshaling yards, tower sites, spur roads from existing access roads) where ground disturbance is substantial or where recontouring is required, surface restoration would occur as required by the landowner or land management agency and would meet DEQ Standards. The method of restoration would normally consist of returning disturbed areas back to their natural contour, reseeding (if required), installing cross drains for erosion control, placing water bars in the road, and filling ditches.

- To minimize ground disturbance and reduce scarring (i.e., landform contrast) of the landscape, the alignment of any new access roads or cross-country route would follow landform contours in designated areas where practicable, providing that such alignment would not adversely impact other resources (e.g., wildlife habitat, cultural resources).

- Non-specular conductors would be used to reduce visual impacts.

- To reduce potential impacts on recreation values and safety, transmission line structures at highway and trail crossings would be placed at the maximum feasible distance from the crossing within limits of standard tower structure design.

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Figure 3.4-4 Photo-Simulation Locations

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Figure 3.4-5 Simulation Viewpoint #1: Wind Farm

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Figure 3.4-6 Simulation Viewpoint #2: Transmission Line

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3.5. Socioeconomics and Public Services

This section presents a demographic profile of population, employment, housing, and income in Valley County and the city of Glasgow. Demographic and economic conditions in the State of Montana are provided for comparison. Local government (county, city, and school district) revenue is included in the affected environment inventory.

The employment, wages, and tax impacts of construction of each wind farm phase and the operation and maintenance of the VCWEP are presented and analyzed in Section 3.5.2. This section also evaluates the current level of existing public services, including law enforcement, fire protection, water and sewer, solid waste, education, and private health sector and emergency medical services. The construction and operational impacts of the proposed wind farm, transmission line and substation on those services are provided, and can be used as an indication of the social impacts of the VCWEP.

3.5.1 Affected Environment

Tables 3.5-1 through 3.5-5 summarize various characteristics of population, employment, income, and housing in Glasgow, Valley County, and the State of Montana.

Table 3.5-1 Montana, Valley County, and Glasgow Population

Area	1990	2000	Percentage Change	2003 Estimate
Glasgow	3,572	3,253	-9%	3,122
Valley County	8,239	7,675	-7%	7,349
Montana	799,065	902,195	13%	917,621

Sources: U. S. Census Bureau 2000

Table 3.5-2 Valley County Full- and Part-Time Employment

Sector	1990	2000	Percentage Change
Farming	808	849	5%
Agricultural Services	95	94	-1%
Mining	6	39	550%
Construction	196	209	7%
Manufacturing	81	108	33%
Transportation/Utilities	282	218	-23%
Wholesale Trade	177	169	-5%
Retail Trade	730	773	6%
Financial	253	265	5%
Services	990	1,169	18%
Government	809	763	-6%
Total	4,427	4,656	5%

Sources: U. S. Census Bureau 2000

Table 3.5-3 Valley County, Glasgow, and Montana Median Household Income

Area	1990	2000	Percentage Change
Glasgow	$20,766	$30,491	47%
Valley County	$21,781	$30,979	42%
Montana	$22,988	$33,024	44%

Sources: Intermountain Demographics, U. S. Census Bureau 2000

Table 3.5-4 1990 to 2000 Valley County Household Income Distribution

Income Range	1990 Households	2000 Households	Percentage Change
Under $10,000	745	410	-45%
$10,000 - $20,000	737	581	-21%
$20,000 - $30,000	653	528	-19%
$30,000 - $40,000	411	454	10%
$40,000 - $50,000	379	337	-11%
$50,000 - $60,000	130	264	103%
$60,000 - $75,000	118	289	145%
$75,000 - $100,000	56	148	164%
$100,000 - $150,000	24	77	221%
Over $150,000	6	55	817%
Total	3,259	3,143	-4%

Sources: U. S. Census Bureau 2000

Local Government Revenue and Expenditures

Valley County

For the 2003 to 2004 fiscal year, Valley County's total budget was $6,797,254. The total county budgets consisted of a county-wide budget of about $3.9 million, a road budget of about $1.2 million, a special district or use budget of $1.6 million, and $74,500 for rural fire control. The largest individual cost in the county's overall budget was $2.9 million for the general fund. Property tax collection was $2.8 million in the 2003 to 2004 fiscal year and represented 41 percent of total revenue. Other sources of revenue included non-tax revenues, cash available, and cash reserves.

City of Glasgow

The City of Glasgow's 2004 to 2005 fiscal year budget was $4,445,834. The largest revenue source in that budget, $1,157,005 or 26 percent of total revenue, is from the general fund. The general fund consists of revenue from taxes, licenses and permits, intergovernmental revenue, services, and fines and forfeitures. The next largest revenue sources are water sales and sewer fees, which account for 15 percent and 8 percent of the total revenue, respectively. The general fund at $1,253,125 is the largest single expenditure in the city's budget. The general fund includes expenditures for city administrative services, law enforcement, fire protection and control, and parks and recreation.

Glasgow School District #1A

Glasgow School District #1A's budget for fiscal year 2003 to 2004 was $6,877,220. Slightly more than 60 percent of the district's revenue ($3,891,909) came from the general fund which is a combination of property taxes, personal taxes, state funding, and various tax levies. The next highest revenue source was miscellaneous Federal funds ($712,891) which accounted for more than 10 percent of the district's revenue that fiscal year. The largest expenditure in the district's 2003 to 2004 fiscal year budget also was the general fund ($3,974,558) which accounted for about 60 percent of all district expenditures. Most of the general fund is used for teacher and administrative salaries. Some teacher salaries are partially funded by other accounts, including miscellaneous Federal funds.

Table 3.5-5 1990 to 2000 Glasgow and Valley County Housing Characteristics

Housing Characteristic	1990	2000	Percentage Change
Glasgow			
Total Housing Units	1,749	1,609	-8%
Occupied Units (Households)	1,530	1,395	-9%
Owner-Occupied	955	965	1%
Renter Occupied	575	430	-25%
Vacant Units	219	214	-2%
Seasonal Units	9	35	289%
Valley County			
Total Housing Units	5,304	4,847	-9%
Occupied Units (Households)	3,268	3,150	-4%
Owner-Occupied	2,332	2,389	2%
Renter Occupied	936	761	-19%
Vacant Units	2,036	1,697	-17%
Seasonal Units	263	376	43%

Sources: U. S. Census Bureau 2000

3.5.2 Environmental Consequences

Methods

The employment and economic impacts of the four phases of the wind farm were determined by using the Impact for Planning (IMPLAN) Model (Minnesota IMPLAN Group 2004). This model is commonly used as part of a project socioeconomic analysis to assist Federal agencies in land and resource management planning. Construction labor force mix, construction labor resource loading, and capital construction costs were estimated using information from other recent wind projects, turbine vendors, and engineering estimates.

IMPLAN is generally used for areas with larger populations and a more diverse economy than that found in Valley County. For this reason, some of the output from the model for the VCWEP, such as industry output and total value added, was of questionable reliability and is not presented in this section (P. Zelus, personal communication 2006).

Information related to public services was obtained by personal interview. Service providers were asked to describe their current facility, level of service, and capacity. They were also asked if those facilities and services could accommodate additional permanent employment, population, and temporary employment due to construction and operation of the wind farm.

Throughout this section, impacts are expressed in dollars current to the time frame of the particular construction phase, or in terms of full-time equivalent (FTE) jobs. In turn, the dollar impacts may refer to employee wages or to tax revenues. The estimated wages and FTE jobs of local resident workers connected to each phase of construction and to facility operation serve as inputs to IMPLAN's Input-Output (I-O) model and constitute direct impacts (or direct economic benefits) from construction and operation of the wind farm and transmission line. Indirect impacts refer to the number of jobs or amount of wages or taxes resulting from the increase in local business activity caused by the direct infusion of jobs and wages during a particular phase of construction or during operation. Indirect impacts (or secondary economic benefits) are measured by applying direct impact inputs to multipliers provided by the IMPLAN model. Induced impacts refer to the number of jobs or amount of wages or taxes resulting from the increase in local business activity caused by the household spending of the workers directly involved in construction or operation. The total impact of each construction phase and of facility operation is then calculated as the sum of direct, indirect, and induced effects.

It is important to note that regional models like IMPLAN estimate the financial benefits of a particular project and the ripple effects of direct jobs and income on all sectors of the local or regional economy. IMPLAN does not take into account other social or economic benefits that might result from the project, or any social, economic, or environmental costs that might occur from the project. To some extent, the public services discussion in Section 3.5 deals with potential costs from this project on local services

The VCWEP involves a 10-year calendar of activity beginning with the start of Phase I construction in 2007 and culminating in full operation of all four construction phases in early 2018. While the employment impacts associated with construction, operation and maintenance remain fairly constant and are based on current industry experience, the dollar values associated with both the cost of standard equipment and the wages paid will escalate with inflation in each year of operation. To maintain a balance between making accurate comparisons of dollars expended in differing years (by using constant dollars), and making reasonable estimates as to what the actual amount of dollars might be in the future (by using inflated dollars), impact estimates utilize 2007 (Phase I), 2009 (Phase II), 2010 (Phase III), and 2010 (Phase IV) dollars for the four construction periods, respectively, and 2010 dollars for operations and maintenance. Application of inflation assumptions beyond the year 2010 is problematic at best, so no attempt was made to generate dollar values for 2012-2013 (Phase III), 2016-2017 (Phase IV), or 2018 (the

year in which full operation is anticipated). IMPLAN uses the Consumer Price Index (CPI) for recent years to estimate future inflation rates.

Prevailing industry practices and previous experience with wind farm development provide a basis for estimating the number and types of workers involved throughout the construction and operation of the VCWEP. Nevertheless, the number of personnel associated with a particular phase is most reliably indicated as a range, with estimated minimum and maximum numbers of workers. The anticipated range of personnel associated with the four construction periods of the VCWEP is provided in Table 3.5-6.

Table 3.5-6 Estimates of Labor Personnel Associated With Project Construction and Operations

	Phase I	Phase II	Phase III	Phase IV
Construction Labor Estimate[1]	112-131	140-147	248-253	267-272
EA Assumption[1]	115	140	248	267
Post-Construction Operations and Maintenance[2]	5	8	12	16

[1]Estimates are for 14-month construction period for each phase.
[2]Estimates are annual (permanent) for the operations and maintenance period of each phase.
Source: Zelus 2006

For this analysis, the lower end of each range was utilized in the economic impact model, allowing for upward modifications as future data might support. Utilizing lower-end estimates effectively eliminates the likelihood that the true economic impacts of the VCWEP can realistically fall below the levels reported.

Employment is cast in terms of FTE jobs throughout this analysis. This usage has several implications for interpretation of model results. First, the number of jobs reported for each construction phase has been adjusted to reflect a 14-month construction period. The 14-month construction period includes project management, design, and the six-to-eight-month period of on-site construction activities. The reader can obtain annualized employment impacts by calculating 12/14 (twelve-fourteenths) of stated phase employment. Second, employment volume will vary considerably within a given 14-month period of construction. Third, the mix of full-time and part-time employment represented in a single FTE job will vary greatly as direct, indirect, and induced impacts are considered. For example, the finding that four FTE jobs are created as a result of spending by construction workers should be interpreted not as four new full-time jobs, but as affecting up to 20 or 30 different whose working hours and wages are increased marginally through overtime opportunities. The total FTE jobs for a phase would include project managers and engineers, field technical staff, skilled labor and equipment operators, and unskilled labor. A number of FTE workers would be employed for road construction, building the interconnection substation, and wind turbine assembly. The total number of individual workers employed could vary, however, depending on whether these different construction activities occur simultaneously or sequentially.

The local impact for all four phases of construction would vary to the extent that local labor is utilized. This analysis assumes that 50 percent of the construction labor will involve workers residing in Valley County. In 2004, the Montana unemployment rate was 4.4 percent and the rate for Valley County was 4.2 percent (Montana Department of Labor and Industry 2005). Surrounding counties in 2004 had unemployment rates ranging from 2.8 percent (McCone County) to 6.4 percent (Roosevelt County). In 2005, the unemployment rate for Valley County was 4.3 percent, and the rate for Valley County was 4.7 percent in January 2006 and 4.6 percent in February 2006 (B. Eldredge personal communication 2006). In general, an unemployment rate of 4.0 to 4.5 percent is considered full employment.

The labor impacts due to the operation and maintenance of the wind farm have been estimated as annual impacts immediately following installation of turbines planned for that phase. Table 3.5-6 shows estimates of 5, 8, 12, and 16 FTE employees associated with the operation and maintenance of the facility after each of the four phases of construction.

Direct tax impacts include State and Federal income taxes, employer and employee Federal Insurance Contribution Act (FICA) contributions on wages earned by workers, property taxes paid by the assumed 50 percent of the construction labor force that would reside in Valley County, property taxes paid by the operator on taxable business property, and both Federal and State corporate income taxes paid on the taxable revenues of the operation during each phase. A portion of the local workers' income tax would not be new income tax created by the project, but would displace income tax that was paid through their previous jobs, assuming that their previous positions were not filled. Likewise, an unknown portion of the property taxes paid by the local labor force may have to be paid whether they work on the VCWEP or not.

The amount of business property and corporate income taxed by the State of Montana and its local government entities is subject to negotiation and involves a complex set of regulations. This analysis applies property tax levies to the installed cost of the number of wind turbines built during each phase of the VCWEP; disaggregates those potential taxes to the County, school district, and City of Glasgow; and makes no adjustments as to what constitutes taxable business property. With respect to corporate income taxes, the anticipated gross revenues resulting from operation of the wind turbines, without depreciation allowances, are used to estimate potential taxes. For both business property and corporate income, the tax impacts reported here are to be viewed cautiously and interpreted only as maximum feasible figures and not as realistic estimates of the actual tax liability. Throughout this section, when outputs of the IMPLAN model are presented, they should be treated as estimates only and not as precise predictions of future wages and taxes.

No Action

Under the No Action Alternative, the proposed wind farm, transmission line, and substation would not be built. The economic benefits and costs that would come to Valley County from the construction, operation and maintenance, and decommissioning of the VCWEP would not occur.

Proposed Action

Construction Impacts

Population and Housing

Construction of the Antelope Creek Substation, 161/230kV transmission line, and installation of 33 turbines at the wind farm would be completed in the first 14-month construction period. Subsequent phases (II through IV) would involve installation of additional wind turbines. In each phase, construction employment would begin with a small crew, progress toward peak employment near the middle of each phase, and taper off into a small clean-up crew at the conclusion of each phase. The highest level of peak employment would be 160 employees in Phases III and IV. Peak employment is projected to last approximately one month in each phase. It is assumed that half the labor force would be hired locally, leaving a peak impact of about 80 employees. Because of the relatively short construction duration for each phase (14 months) and monthly fluctuations in the number and types of employees, it is expected that non-local construction employees would temporarily locate to the county and not bring their families with them. The population impact of the VCWEP on the Valley County area is an influx of temporary construction employees. A peak population gain of about 80 persons is expected at two points in Phases III and IV of the four-phase construction process.

Temporary construction workers would require short-term housing accommodations. There are currently eight motels in Glasgow with a total of 238 rooms. There is also a hotel containing an additional 66

rooms. Glasgow also has four recreational vehicle parks, three of which can accommodate large mobile homes. Additional temporary housing could be provided at St. Marie, the former Glasgow Air Force Base. There are between 200 and 300 vacant four-plexes and a 100-room barracks that could be made available for occupancy on short notice (L. Mires personal communication 2004). Thus, available housing in the area should be sufficient to accommodate the temporary influx of workers during each phase of construction.

Employment, Income, and Taxes

Phase I. Between 112 and 131 FTE workers are expected to be involved in engineering and design, road and foundation preparation, substation and transmission line construction, wind turbine assembly and erection, facility decommissioning and site cleanup (Table 3.5-6). Of the 131 FTE workers, between 36 and 47 would be involved in 161/230kV transmission line construction and 11 in Antelope Creek Substation construction. Actual personnel at any one time would be less. The local labor force is expected to provide 66 construction and special trades workers at wages of $1.9 million over the 14-month Phase I construction period, averaging $28,800 per employee. The impacts of this employment and these wages on the Valley County economy are summarized in Table 3.5-7.

Table 3.5-7 Phase I Construction Jobs, Wages and Taxes

FTE Jobs and Wages[1]			Taxes	
Impact Type	**FTE Jobs**	**Wages**	**Jurisdiction**	**Estimated Taxes**
Direct	66	$1,898,232	Federal	$123,349
Indirect	9	$212,845	State	$54,581
Induced	15	$369,064	Local (Property)	$139,963
Total	90	$2,489,141	Total	$317,893

[1]For 14-month construction period.
Source: Zelus 2006

Wages totaling $1.9 million would stimulate local consumer spending that results in another 15 induced FTE jobs being added to the Valley County economy, with most of that increase occurring in the retail trade and services sectors as extended-hours employment for existing employees. Those induced impacts are represented by wages totaling $369,064. Additionally, the 66 local construction jobs would be part of a larger indirect impact of the Phase I construction activity, as nine FTE jobs with $212,845 in wages would be stimulated primarily in the transportation and warehousing sectors of the local economy. The total impact of Phase I construction is expected to represent an infusion of 90 FTE jobs and wages totaling $2.48 million on the local economy.

The impact of these additional wages would include increases in Federal, State and local tax collections as well as the increases in consumer spending noted above. Phase I construction activity would stimulate an additional $123,349 in Federal income tax and social insurance (FICA) contributions, and Montana personal income taxes of $54,581. A small portion of these taxes would have been paid anyway by local workers who would have other jobs without the wind farm. Assuming that all 66 construction employees would be homeowners, their $139,963 in annual state and local property taxes could be at least partially credited to VCWEP activity, but not counted as direct benefits because a portion of the property taxes would have been paid anyway.

The amount of corporate income tax and business property tax due to the State of Montana and its local governments are subject to a complex set of regulations and circumstances, and cannot be estimated reliably. Potentially significant impacts are involved, however, and should not be discounted. For example, projected gross revenues from wind farm activity utilizing Phase I capacity would result in $597,178 in Montana corporate income tax, if no depreciation is considered. In a similarly unlikely scenario, if the entire installed cost of the 33 wind turbines erected in Phase I were subject to Montana property tax, $721,063 in property tax revenue would be collected and distributed across local taxing jurisdictions. Proportionate to 2003-2004 property tax levies, the Glasgow School District ($283,486) and City of Glasgow ($220,218) would receive about 70 percent of all property tax collections, the remaining $217,360 benefiting county-wide agencies and services. These amounts should be considered high estimates due to depreciation.

Phase II. Wages earned by 81 FTE workers during Phase II construction are expected to total $2.8 million in 2009 dollars (Table 3.5-8). The wages earned by the estimated 81 FTE local construction workers during Phase II would stimulate an induced impact of 23 FTE jobs with associated wages totaling $545,396 as household spending generates the need for other workers to meet the increased demand placed on local gas stations, restaurants, banks, and movie theatres. The installation of 63 wind turbines in Phase II is expected to have an indirect impact of 14 FTE jobs and aggregate wages of $314,537 among those local business establishments that provide raw materials, equipment, or services used during the construction phase (Table 3.5-8).

Table 3.5-8 Phase II Construction Jobs, Wages and Taxes

FTE Jobs and Wages[1]			Taxes	
Impact Type	**FTE Jobs**	**Wages**	**Jurisdiction**	**Estimated Taxes**
Direct	81	$2,805,165	Federal	$182,283
Indirect	14	$314,537	State	$80,659
Induced	23	$545,396	Local (Property)	$147,470
Total	118	$3,665,098	Total	$410,412

[1]For 14-month construction period.
Source: Zelus 2006

A potential tax of $3.0 million includes an estimated $1.4 million in property taxes and $1.2 million in Montana corporate income taxes associated with Phase II construction. As discussed elsewhere, those two estimates are to be interpreted as high-end maximums that do not take into account the anticipated depreciation allowances and negotiations that would actually take place.

Taxes associated with the total wage impact are more reliably calculated at $182,283 in Federal FICA and withholding equivalents, $80,659 in Montana personal income taxes, and an estimated $147,470 in combined property taxes paid by the 81 construction workers who are all assumed to own or rent houses locally. Prorating that property tax revenue to the major taxing jurisdictions involved, Phase II construction is expected to account for $57,978 in property tax revenue to the Glasgow School District, $45,039 to the City of Glasgow, and $34,454 to Valley County taxing authorities. A portion of these taxes would have been paid by local workers who already had jobs.

Phase III. Wages earned by 144 FTE workers are expected during Phase III construction to total $5.2 million in 2010 dollars (Table 3.5-9). The direct impacts of project construction are expected to generate indirect impacts that stimulate 20 additional FTE local jobs and $580,988 in associated wages. The local

spending of $5.2 million in wages is expected to have the induced impact of 33 FTE jobs and wages totaling $1.0 million. The total impact of Phase III construction is estimated at 197 FTE jobs with wages exceeding $6.7 million.

Table 3.5-9 Phase III Construction Jobs, Wages and Taxes

FTE Jobs and Wages[1]			Taxes	
Impact Type	**FTE Jobs**	**Wages**	**Jurisdiction**	**Estimated Taxes**
Direct	144	$5,181,470	Federal	$325,104
Indirect	20	$580,988	State	$148,986
Induced	33	$1,007,409	Local (Property)	$261,233
Total	197	$6,769,867	Total	$735,323

[1]For 14-month construction period.
Source: Zelus 2006

The high end estimate of taxes associated with the Phase III total wage impact of $4.7 million are calculated at $325,104 in Federal FICA and withholding equivalents, $148,986 in Montana personal income taxes, and an estimated $261,233 in combined property taxes paid by the 144 construction workers who are all assumed to own homes locally. Prorating that property tax revenue to the major taxing jurisdictions involved, Phase III construction is expected to account for $102,704 in property tax revenue to the Glasgow School District, $79,783 to the City of Glasgow, and $78,747 to Valley County taxing authorities. Some of these taxes may be paid anyway regardless of future VCWEP employment.

Phase IV. The total wage impact of Phase IV construction is estimated at nearly $7.3 million and 209 FTE jobs within the local economy (Table 3.5-10). The scope of Phase IV construction is considerably larger than the previous expansions and may be above the current capacity of the local force to provide workers. For these reasons, the actual local impact may be lower than the estimates provided, and some current job patterns in the local area could be temporarily disrupted.

Table 3.5-10 Phase IV Construction Jobs, Wages and Taxes

FTE Jobs and Wages[1]			Taxes	
Impact Type	**FTE Jobs**	**Wages**	**Jurisdiction**	**Estimated Taxes**
Direct	155	$5,583,698	Federal	$350,341
Indirect	21	$626,089	State	$160,552
Induced	33	$1,085,612	Local (Property)	$281,512
Total	209	$7,295,399	Total	$792,405

[1]For 14-month construction period.
Source: Zelus 2006

Nevertheless, Phase IV construction would have significant impacts on the Valley County economy. Table 3.5-10 specifies that in addition to the 155 local construction workers involved, an additional 54

FTE jobs would be generated as a result of the indirect and induced stimuli provided by the direct impact of $5.6 million in local wages.

While tax regulations and rates may change by 2016, Phase IV activity is anticipated to generate a combined $792,405 impact on Federal, State and local taxing jurisdictions. About half of that amount is represented by the $350,341 in Federal withholding and social security contributions made by the estimated 209 FTE direct, indirect, and induced employees during Phase IV. Similarly, about $160,552 in Montana personal income taxes can be credited to those employees. Finally, another $281,512 in property taxes can be attributed to the 155 construction workers assumed to be homeowners in the area, although some of these property taxes would have been paid anyway. Prorated according to 2003-2004 tax levies, the $281,512 in property taxes would be credited to the Glasgow School District ($110,676), City of Glasgow ($85,976), and Valley County taxing authorities ($84,860).

Operation and Maintenance Impacts

Population and Housing

The operation and maintenance phase of the wind farm would begin in November 2008 with the completion of Phase I construction. At that time, five permanent employees, including three managers and two highly skilled technicians, would be hired (Table 3.5-6). The three managers would be brought in from outside Valley County. Those three managerial positions would remain in place for the duration of the wind farm operation. Only the number of technicians would increase as each successive phase is completed. It is assumed that half the wind farm technicians would be local hires.

An additional three technicians would be hired at the completion of Phase II in November 2010. Two of those technicians would be local hires. One additional technician would be hired from outside the area. Total employment would reach eight employees.

When Phase III is completed in November 2013, the total operations and maintenance workforce would expand to 12 persons. Four new technicians would be added, with three of those positions coming from outside the local area.

At the end of Phase IV construction in November 2017, the total operations and maintenance staff would reach 16 employees. Again, four new technicians would be added, with out-of-area hires accounting for two positions. Total population moving to the local area resulting from that employment gain would be between 35 and 41 persons, depending on household size. An additional 17 housing units would be required to house that additional population. The 2000 Census reported a total of more than 1,300 year-round vacant housing units in the county, with about 180 vacant units in the city of Glasgow. Thus, housing should be more than sufficient to accommodate a permanent influx of workers.

Employment, Income, and Taxes

When Phase I construction is completed in 2008 the operation and maintenance of the VCWEP would begin. The annual impacts associated with the ongoing operation of the facility are estimated in Table 3.5-11. The totals presented in Table 3.5-11 are not cumulative. For example, it is estimated that 13 FTE jobs (direct, indirect, and induced) would occur each year during the operation of Phase I. Following construction of Phase II, it is estimated that the number of FTE jobs would increase by 4 to 17. The number of FTE jobs would remain at 17 until the construction of Phase III.

Table 3.5-11 Annual Facility Operations and Maintenance FTE Jobs[1], Wages and Taxes

	FTE Jobs and Wages[1]			Taxes	
	Impact Type	**FTE Jobs**	**Wages**	**Jurisdiction**	**Estimated Taxes**
Phase I					
	Direct[2]	4	$505,110	Federal	$79,377
	Indirect	4	$107,253	State	$13,795
	Induced	5	$125,560	Local (Property)	$8,427
Total		13	$737,923		$101,599
Phase II					
	Direct[2]	5	$631,387	Federal	$99,221
	Indirect	5	$134,066	State	$17,243
	Induced	7	$156,950	Local (Property)	$10,534
Total		17	$922,403		$126,998
Phase III					
	Direct[2]	8	$1,010,220	Federal	$158,753
	Indirect	8	$214,506	State	$27,589
	Induced	11	$251,120	Local (Property)	$16,854
Total		27	$1,475,846		$203,196
Phase IV					
	Direct[2]	10	$1,262,774	Federal	$198,441
	Indirect	10	$268,133	State	$34,486
	Induced	13	$313,899	Local (Property)	$21,067
Total		33	$1,844,806		$253,994

[1]Annual (permanent) estimates of out-of-area hires.
[2]Wages based on an assumption that work force includes managers and highly skilled technicians. Wages are also inflation-adjusted.
Source: Zelus 2006

Approximately 16 full-time managers and technical personnel are expected to be needed to operate and maintain the facility after Phase IV installation is completed in 2017, 10 of whom are assumed to be resident to the local community. Given the comparatively specialized skills involved, it is likely that all 10 of those workers would have relocated from outside of the area to work at the facility.

The operations and maintenance impacts on wages occurring after Phases I, II, III, and IV are also estimated in Table 3.5-11. For example, after the 33 turbines, 161/230kV transmission line, and Antelope Creek Substation installed during Phase I are fully operational, a local direct impact of four FTE technical and managerial workers is projected to occur. Wages of $505,110 for these four workers would stimulate indirect and induced wage impacts of $232,000 as discretionary spending benefits to local merchants and businesses. After Phase IV is complete, an additional 134 turbines would be brought online, with the operations and maintenance impact associated with that incremental activity totaling 33 FTE workers and involving $1.8 million in wages annually from direct, indirect, and induced labor effects.

The 16 operations and maintenance workers would earn an aggregated salary of at least $2 million, and stimulate an equal number of FTE jobs in the local economy due to the way in which the day-to-day operation of the facility would utilize local industry and labor. While the wages associated with the jobs generated by indirect impacts average about $26,800 per worker on an FTE basis, the realistic scenario is that the majority of the wages would enable overtime and extended hours for existing workers in sectors such as transportation and warehousing.

Induced impacts from the local spending associated with the wages of the facility managers and technical personnel would total $502,239, a proportionately greater impact than that associated with the households of construction workers. New housing construction and impacts on public school, safety and health services are assumed to be the cause, because of the household spending of operations personnel, so the resulting annual indirect effects are higher than they would be if no population relocation is assumed.

The tax impact associated with facility operation would be dependent upon the property valuation and profitability of the VCWEP during its initial years of operation, and the negotiations between Wind Hunter and the State of Montana regarding tax incentives. For these reasons, estimates of corporate income and property taxes are not provided.

Taxes associated with the total wage impact of operations and maintenance workers can be estimated on an annual basis and in terms of the scope of the construction. For example, after Phase I, $101,598 in Federal, State and property taxes are attributed to the direct, indirect, and induced labor impacts of the four full time workers associated with post-Phase I operations and maintenance. Similarly, the 10 workers associated with post-Phase IV operations and maintenance would generate $253,995 in taxes through the total impacts on their $1.2 million in direct salaries.

As a percentage of income, operations and maintenance taxes would be greater than the taxes paid by the construction employees referred to in Phases I through IV due to the higher tax brackets of the operations personnel.

Combined Construction and Operations and Maintenance Impacts

Over the course of four phases of construction, a projected total wage impact of $20.2 million and 614 FTE employees in the Valley County economy can be credited to the proposed wind power project (Table 3.5-12). The operations impacts would generate another 90 FTE jobs and $5.0 million in wages annually. Not counting the considerable property taxes and corporate income taxes that have been omitted from these calculations, the tax impact of the $25.2 million in local wages is estimated at $2.9 million for four selected annual periods spanning the four phases of construction and post-installation facility operation.

Table 3.5-12 Combined Total Economic Impacts

	Construction (14-month period)			Operations and Maintenance (Annual)		
Phase	**FTE Jobs[1]**	**Wages**	**Employee Taxes**	**FTE Jobs[2]**	**Wages**	**Employee Taxes**
Phase I	90	$2,480,141	$317,893	13	$737,923	$101,599
Phase II	118	$3,665,098	$410,412	17	$922,403	$126,998
Phase III	197	$6,769,867	$735,323	27	$1,475,846	$203,196
Phase IV	209	$7,295,399	$792,405	33	$1,844,806	$253,994
Total	614	$20,210,505	$2,256,033	90	$4,980,98	$685,787

[1]Total jobs during 14-month construction period.
[2]Annual jobs during operation of each phase before construction of next phase.
Source: Zelus 2006

With respect to the employment impacts occurring across several phases and over several years, it is incorrect to conclude that the total employment impact of 704 FTE workers would involve 704 separate individuals. Rather, the direct impacts associated with the four construction phases would be likely to employ a core of workers through several phases of construction. On the other hand, the number of individuals involved in the induced and indirect employment impacts would most certainly tally five to eight times the number of FTE jobs (including both full-time and part-time workers), owing to the way in which such impacts involve extended hours for existing employees and temporary hours for part-time employees. Given the relatively low population of Valley County, the modest employment impacts estimated above would likely involve at least a third and up to half of all Valley County construction and skilled trade workers.

Finally, Table 3.5-12 reveals that while the operations and maintenance labor impact is only about 15 percent of the associated construction impact for a given phase, the economic impact of the wages and taxes associated with the more highly paid operations personnel would be about 25 percent of the value of the wages and taxes associated with the more numerous but lower paid construction workers. Operations personnel are generally managers and high skilled workers requiring higher pay.

Rents and Royalties

Federal

Methods to calculate payments to the Federal government from the generation of electricity at the wind farm were based on BLM's Interim Wind Energy Development Policy. According to the policy statement, "Rent for commercial wind energy development right-of-way grants will consist of two components: 1) an annual minimum rent and 2) an annual production rent once VCWEP is in commercial production. The rent for any calendar year shall not be less than the minimum rent (BLM 2005)."

Annual Minimum Rent. The annual minimum rent for a commercial wind energy development right-of-way on public land will be $2,365 per megawatt and is based on the total anticipated installed capacity of the wind energy project on public land based on the approved POD, a capacity factor of 30 percent, a royalty of 3 percent, and an average purchase price of $0.03 per kilowatt hour. These factors only apply to the calculation of the minimum rent and do not establish any basis for the calculation of actual production rental fees during commercial wind energy operations. The minimum rent is a fixed BLM-wide rent based on the following formula:

> "Annual minimum rent = (Anticipated total installed capacity in kilowatts as identified in the approved POD) x (30% capacity factor) x (3% royalty) x $0.03 average price per kilowatt hour) (BLM 2005)."

The annual minimum rent is phased in with 25 percent of the total minimum rent fee in the first year, 50 percent of the total minimum rent fee in the second year, and 100 percent of the total minimum rent fee in the third year of operation. The full annual minimum rental fee would apply at any time prior to three years, upon the start of the commercial operations of the VCWEP. The minimum rental fee would be paid annually, in advance, on a calendar year consistent with regulations.

Annual minimum rent attributable to each phase of the wind farm was estimated using the Interim Wind Energy Development Policy and the conceptual site plan showing the proposed location of individual turbines by phase (see Figure 2.3-1). Individual turbines on the wind farm would be located on BLM, State of Montana, or private land. At a conceptual level, in Phase I, eight of the 33 total wind farm turbines (24 percent) could be located on BLM land. It was assumed that electrical production would be the same among the turbines and that 24 percent of total electrical production would be produced by the turbines on BLM land. The conceptual plan was used to site turbines in each of the four phases to determine future levels of annual minimum rent. All future annual minimum rent payments were calculated in 2004 dollars. Any change in BLM's formula to calculate annual minimum rent would impact future rent payments.

The annual minimum rent from Phase I electrical production is expected to begin in 2008 with a payment of $7,025 and increase to $28,099 in the third year of Phase I production. Annual minimum rent payments from Phase II would begin in 2010 at $22,409 and increase to $89,878 by 2012. Phase III annual minimum rent would begin in 2013 at $31,043 and reach $124,173 by 2015. Annual minimum rent from Phase IV of the wind farm would begin at $70,956 in 2017 and would be $283,824 by 2019.

Annual minimum rent from each phase of the wind farm is cumulative. Rent from preceding phases would continue to be paid as each succeeding phase comes into operation. The initial annual minimum rent payment would be $7,025 beginning in 2008. Total annual minimum rent would reach $50,568 when Phase II is completed, $149,020 when Phase III becomes operational, and $313,106 when Phase IV begins production. Cumulative annual minimum rent would reach $525,974 by 2019 when rent from the fourth phase would reach 100 percent in its third year of operation.

Annual rents for the transmission lines and associated access roads cannot be determined until later in the design process.

Production Rent. The second component of the rental is production rent. "In addition to the minimum rent, a wind energy production rent fee will be required as part of the development right-of-way grant and will apply for any operations greater than the annual minimum rent. The wind energy production rental fee formula will be determined by the Authorized Officer at the time of the issuance of the right-of-way grant using comparative market surveys, appraisals, or other reasonable methods. The site-specific appraisal will use a percent of gross proceeds methodology based on actual sales of electricity and market supported rates. Gross proceeds will include any revenue from the sale of wind energy production from public land, including revenue from the sale of production credits (Renewable Energy Credits) (BLM 2005)."

Payment of the annual production rent begins when the facility is in commercial operation. The formula to determine the production rent is a part of the development Right-Of-Way Grant and is determined at the time the Right-Of-Way Grant is issued. No analysis of the annual production rent is included in this section because the wind farm project is not in operation.

State of Montana

Wind Farm Revenue. Revenue would accrue to the State of Montana from the wind farm turbines located on State land and from that portion of State land traversed by the transmission line. Initially, the State would receive $1.50 per acre for each acre of State land included in the wind farm. Montana also would receive $1,000 for each turbine located on State land. Once the facility is in production, the State would receive a royalty of 2.5 percent of gross revenue from the number of turbines located on State land or $1,200, whichever is greater. The royalty is paid annually (H. Richards, personal communication 2004).

At this time, the exact amount of State of Montana acreage needed for the wind farm operation has not been determined. That precise acreage would be determined as final site plans are approved. However, the conceptual plan does contain the number of turbines to be located on State land by phase. In Phase I, the state would receive $6,000 for turbines located on State land. No turbines are scheduled for development on State land in Phase II and no revenue would accrue to the State. In Phase III, the State would receive a one-time payment of $21,000. The Phase IV one-time payment for turbines is estimated at $14,000.

Annual royalty payments to the State of Montana would begin in 2008 when Phase I has been completed. Total anticipated royalties to the State are estimated at $39,709 annually from Phase I of the wind farm operation. None of the wind turbines in Phase II would be located on State land; no royalty payments would be received from that phase of the wind farm. Royalties from completion of Phase III would amount to $133,700 annually and would begin in 2014. Phase IV royalties would begin in 2018 at an estimated total of $89,133 annually.

Cumulative annual royalty payments would begin at $39,079 with the completion of Phase I, reach $172,779 at the completion of Phase III, and level out at $261,912 with the completion of Phase IV. Royalty payments would remain at that amount for the life of the facility.

Estimates of royalty payments were based on gross revenue projections for the wind farm. Gross revenue for each phase was based on the estimated kilowatts produced per year from each phase, a payment rate per kilowatt hour, the number of hours per year the turbines would be in use, and a capacity factor for each turbine. The gross revenue for each phase was allocated by the number of wind turbines and land ownership. Gross revenue was factored by the percentage of turbines located on State of Montana land. All royalty payments were calculated at a 2.5 percent rate of gross revenue. Any change in the method to calculate royalties by the State of Montana would affect future royalty payments. All royalty payments were calculated in 2004 dollars.

Conveyance. A second source of revenue to the State of Montana would be for use of its land in the transmission line corridor. The State has options to collect revenue for that conveyance land through an easement. An easement is a one-time fee or an annual rental rate. An easement also can be a negotiated value for the acreage under the transmission line. Final easement rental is subject to the number of acres in conveyance land and negotiations between Wind Hunter and the State of Montana. The money would be paid to the School Trust Fund and distributed throughout the State of Montana (H. Richards, personal communication 2006).

Private Landowners

A portion of the wind farm would be located on private land. Current plans call for annual leasing of those properties. The amount of private land to be leased would be dependent on the final siting for each phase of the wind farm. Final leasing arrangements would depend on negotiations with affected property owners. Leasing of private land for the wind farm would provide additional income to those property owners. In a report analyzing the detailed economic impact of wind farms, it was stated that, “Of all local groups that benefit from wind energy development, rural land owners could reap the greatest rewards (Agricultural Utilization Research Institute 1996).”

Decommissioning

The economic life of the turbines at the wind farm is 20 years. When the economic life of the turbines in each phase is reached, the turbines would be replaced or decommissioned. A slight positive impact to the local economy would occur as construction crews temporarily move to the area and local labor is used to replace or decommission the turbines. Permanent employment at the wind farm would be ongoing until decommissioning. Employment and tax benefits would cease when the wind farm is decommissioned.

Public Service Impacts

Valley County and City of Glasgow public services would be impacted by construction and operation of the wind farm, substation, and transmission line. This section discusses the impact of those facilities on law enforcement, fire protection, water and sewer provision, solid waste, education, hospital services, and emergency medical services.

Service providers were interviewed and asked whether or not they have the capacity or would be able to accommodate the impact of the proposed VCWEP. All service providers indicated that they would be able to accommodate the construction and operations and maintenance phases of the facility. Their responses fell into two general categories. The first was that Glasgow and Valley County had serviced higher levels of population in the past and had been able to do so without negatively impacting their level of service. The second general response was that service providers were used to fluctuations in the work force because of other large construction projects.

Law Enforcement

The Glasgow Police Department is responsible for law enforcement within the city limits of Glasgow. The department does not expect future permanent employees and the resulting resident population to cause an impact on department operations. An additional influx of temporary employees also would not cause an increase in the department's workload. The department has experienced that type of impact before from previous construction projects in Valley County and has adjusted to it (B. Barstead, personal communication 2004).

The Valley County Sheriff's Department is responsible for law enforcement in the unincorporated county. It has a staff of seven with five road deputies. The amount of increased traffic at the construction sites due to workers commuting and delivery of construction materials would increase the department's workload. The department is used to that type of impact and has dealt with fluctuations in the County's workforce. Additional traffic would not pose a problem to the department (V. Buerkle, personal communication 2004).

Fire Protection

The Glasgow Volunteer Fire Department provides fire protection and suppression within the City of Glasgow. The department would be able to provide fire protection for temporary workers and additional permanent residents due to the impact of VCWEP construction and maintenance without causing an additional burden to the department (J. Konodel, personal communication 2004).

The wind farm would be served by the LongRun Fire District. The district is responsible for responding to all fire calls in unincorporated Valley County. The fire department has mutual aid agreements with the BLM and Roosevelt County. The department also has a HAZMAT team. The department would be able to assume the extra fire protection duties associated with the wind farm. Response time to the wind farm would vary between 35 and 60 minutes (D. Carney, personal communication 2004).

Water and Sewer

Water and sewer service within the City of Glasgow is provided by the City. Water and sewer infrastructure is in place for a larger population. Both systems have excess capacity and could handle the

demand from temporary construction workers and permanent employees (J. Bengosha, personal communication 2004).

Solid Waste

Valley County Refuse District #1 is responsible for the County's 160-acre solid waste landfill. The district is responsible for disposing of solid waste for cities and unincorporated areas of Valley County.

Additional solid waste is expected to be generated from the construction and operation of the wind farm and from residential sources from the temporary construction workers and permanent employees. The landfill is capable of handling solid waste generated from both sources. The county landfill has an expected life capacity of more than 100 years (K. Knierim, personal communication 2004).

Education

The VCWEP and the City of Glasgow are located in Glasgow School District #1A. The impact of the wind farm on school district enrollment is expected to be minimal.

The highest level of hiring by the wind farm would be temporary construction workers who are not expected to move to the area permanently or to bring their families with them. Local hiring would not impact enrollment as local workers either do not have school-aged children or already have children enrolled in the school system. Some new employees would be hired at the wind farm over the four phases of development and would move to the area permanently. Those employees may or may not have school-aged children. The school district currently has the capacity to accept new students, in part because it has handled higher levels of enrollment in the past. (K. Doornek, personal communication 2004).

Hospital Services

Frances Mahon Deaconess Hospital is located in Glasgow and provides medical services for all of northeastern Montana. It is a 25-bed critical access facility that provides primary and some secondary and tertiary medical care for the region. The hospital has been able to maintain the same level of services and number of doctors it had when the city and county populations were higher in the late 1970s. The facility is capable of serving a much larger population and would be able to accommodate population increases due to temporary construction workers as well as workers moving to the area with their families (R. Holom, personal communication 2004).

Emergency Medical Services

Frances Mahon Deaconess Hospital also provides emergency medical services for all of Valley County. The emergency medical service is headquartered at the hospital. The level of staffing and number of ambulances are adequate to support the construction impact and ongoing operation and maintenance of the VCWEP. No additional training would be necessary for existing personnel. Emergency medical personnel indicated that some type of industrial first aid kit should be provided at the wind farm in order to begin pretreatment procedures (C. Berger, personal communication 2004)

Alternative A

Socioeconomic impacts associated with Alternative A are assumed to be very similar to those associated with the Proposed Action.

3.6 Environmental Justice

Executive Order (E.O.) 12898 requires Federal agencies to address disproportionately high and adverse human health and environmental effects of their actions, programs, and policies on minority and low-income populations. The BLM's Wind Energy Development PEIS (BLM 2005) follows CEQ guidelines in assessing environmental justice issues. The three primary steps in this assessment are to determine: 1)

the geographic distribution of low-income and minority populations; 2) whether any impacts would be high and adverse; and 3) whether these impacts would disproportionately affect the low-income and minority populations.

3.6.1 Affected Environment

Data on income for Montana, Valley County, and Glasgow are summarized in Tables 3.5-3 and 3.5-4. According to poverty statistics for 2000, the State of Montana had a low-income population of 117,677 or 13.3 percent of the total state population, while Valley County had a low-income population of 1,132, or 15.2 percent of the total Valley County population. About 9 percent of Glasgow's population lived below the poverty level in 2000.

Information on the racial background of Valley County's population is presented in Table 3.6-1. Census data indicate that 11.9 percent of the population in Valley County is minority, of which most are American Indian.

Table 3.6-1 Valley County Population by Race and Hispanic Origin

		2000	
Race	**1990**	**Number**	**Percentage**
White	7,423	6,765	88.1%
Black	9	10	0.1%
Indian	770	723	9.4%
Asian	19	20	0.3%
Other	18	157	2.0%
Total	8,239	7,675	100.0%
Hispanic Origin[1]	62	60	0.8%

[1]The U.S. Census Bureau treats Hispanic Origin as a separate category because Hispanic groups include people of different races.
Sources: Intermountain Demographics; U. S. Census Bureau 2000

3.6.2 Environmental Consequences

No Action

No environmental justice impacts are associated with the No Action Alternative.

Proposed Action

Most of VCWEP area is sparsely inhabited. Identified environmental impacts associated with the construction, operation, maintenance, and decommissioning of the proposed wind farm, Transmission Route C, and Antelope Creek Substation would affect the area's population equally, without regard to ethnicity or income.

It is possible that impacts on traditional cultural properties (TCPs) could disproportionately affect Native Americans concerned about these cultural resources. Specific TCPs have not yet been identified in the VCWEP vicinity. If TCPs are identified during future investigations performed to comply with Section 106 of the National Historic Preservation Act, measures would be identified to mitigate impacts. Additional information about TCPs can be found in Section 3.12.

Based on CEQ guidelines and Valley County population data, no minority or low-income populations would be disproportionately affected from construction and operation of the Proposed Action.

Alternative A

Under Alternative A, potential environmental justice impacts associated with wind farm, Transmission Route A, and substation construction, operation, maintenance, and decommissioning would be identical to those associated with the Proposed Action.

3.7 Biological Resources

3.7.1 Affected Environment

Data on biological resources in the study area were obtained from a variety of sources, including literature review, reports from the Montana Natural Heritage Program (MNHP), species recovery and management plans, technical reports, and peer-reviewed journal articles. Information and species lists were obtained through meetings and correspondence with personnel from the USFWS, BLM, and Montana Fish Wildlife and Parks (MFWP). In particular, local wildlife biologists with the BLM and MFWP provided valuable information and mapping of sensitive species and important habitats within the study area. The MNHP furnished data on the occurrence of special status plant and wildlife species in the area. For this EA, field investigations and biological studies were conducted between September 2004 and December 2005 to evaluate biological resources in the study area (WEST, Inc. 2005). A summary of these studies is included in Appendix D. The potential for occurrence of plant and wildlife species not observed during field investigations was assessed based upon evaluation of species distribution and habitat requirements. An analysis of NEXRAD data from the Glasgow International Airport failed to identify any large avian migrations through the study area (WEST, Inc. 2006).

Ecological Overview

The VCWEP is located within the Northwestern Glaciated Plains ecoregion of the Great Plains physiographic province (Omernik 1987). This area is characterized by level to gently rolling glacial till plains and the primary native vegetative community is grama-needlegrass-wheatgrass short-grass prairie (Kuchler 1964). The northern portion of study area, from U.S. Highway 2 to Kerr Road, contains extensive upland plateaus interspersed by several small, ephemeral drainages that generally trend north to south. The southern portion of the study area extends from U.S. Highway 2 south to Billingsley Road. This area contains relatively flat terrain and rolling hills, and includes the Milk River Valley. This portion of the study area supports the most development, and native vegetative communities have been fragmented by agricultural land uses. Most of the Milk River Valley has been converted into agricultural land.

Vegetation

General Vegetation Characteristics

The northern portion of the study area is dominated by native short- and mid-grass prairie communities intermixed with small patches (<0.1 acre) of badland, shrubland, and riparian vegetation (Figure 3.7-1). The most common communities on these plateaus support native grass species including western wheatgrass (*Pascopyrum smithii*), thickspike wheatgrass (*Elymus lanceolatus*), needle-and-thread (*Hesperostipa comata*), and blue grama (*Bouteloua gracilis*). These native grassland communities are relatively undisturbed and intact (Cooper et al. 2001). The northern and northwestern boundaries of the study area are adjacent to the Bitter Creek WSA, which contains highly dissected terrain dominated by specialized, drought- or salt-tolerant shrubs and herbs (Cooper et al. 2001). Small, isolated patches of silver buffaloberry (*Shepherdia argentea*) occur throughout the northern portion of the study area in protected draws and swale bottoms. There is little Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) in this portion of the study area, while silver sagebrush (*Artemesia cana*) communities commonly occur along relatively mesic floodplain terraces. Native grasslands in the southern portion of the study area have been reduced and fragmented by agricultural land uses. The only sagebrush steppe habitat occurs in the southwest corner of the study area.

Riparian communities in the northern portion of the project area are generally restricted to the bottoms of coulees and ephemeral streams. These riparian zones generally consist of herbaceous and willow (*Salix* spp.) communities with western snowberry (*Symphorocarpos occidentalis*), Wood's rose (*Rosa woodsii*), and silver sagebrush on the upper floodplain terraces. Buggy Creek supports narrow, discontinuous patches of cottonwood forest interspersed by silver sagebrush-western wheatgrass. The Milk River supports a significant forested riparian community dominated by mature cottonwood trees and an understory of boxelder (*Acer negundo*), peachleaf willow (*Salix amygdaloides*), redosier dogwood (*Cornus sericea*), yellow willow (*Salix lutea*), and chokecherry (*Prunus virginiana*).

The relatively undisturbed and intact native plant communities within the study area minimize opportunities for establishment of invasive, non-native plant species. Non-native species that are known to occur in the study area included spotted knapweed (*Centaurea maculosa*), leafy spurge (*Euphorbia esula*), Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), quackgrass (*Agropyron repens*), and brome (*Bromus* spp.). Russian olive (*Elaeagnus angustifolia*) has become well established in the Milk River Valley.

Special Status Plant Species

Special status plant species that are known to occur or that may occur in the study area are listed in Table 3.7-1. Chaffweed (*Anagallis minima*) has recently been found in the Dry Fork Creek landscape approximately 28 miles north of Glasgow (Cooper et al. 2001; MNHP 2004a). Bractless mentzelia (*Mentzelia nuda*) has been detected in the eastern part of Valley County (MNHP 2004a). Hot spring phacelia (*Phacelia thermalis*) was found near Larb Creek on the western border of Valley and Phillips counties, and five-leaf cinquefoil (*Potentilla quinquefolia*) was observed 6 miles west of Opheim in 1983 (MNHP 2004a). Poison suckleya (*Suckleya suckleyana*) was observed in the Milk River Valley near the Glasgow area in 1900 (Cooper et al. 2001; MNHP 2004a). Currently, Valley County does not contain any rare bryophytes and a county distribution for rare lichen species is not yet available (MNHP 2003).

Figure 3.7-1 Habitat Map

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Table 3.7-1 Botanical Species of Concern that May Occur Within the Study Area

Common Name	Species	MNHP	BLM	Habitat
Chaffweed	*Anagallis minima* syn. *Centunculus minimus*	S2	S	Vernally wet, sparsely vegetated soil around ponds and along rivers and streams in the valleys and on the plains. Associated with western wheatgrass and least spikerush.
Bractless Mentzelia	*Mentzelia nuda*	S1	S	Sandy or gravelly soil of open hills and roadsides on the plains.
Hot Spring Phacelia	*Phacelia thermalis*	S1	-*	Sparsely vegetated soils in grasslands and open woodlands
Five-leaf Cinquefoil	*Potentilla quinquefolia*	S2	-*	Dry, gravelly soil of exposed ridges and slopes in the montane to alpine zones.
Poison Suckleya	*Suckleya suckleyana*	S1	-	Drying mud along shallow ponds and streams, and in disturbed, often alkaline, soil on the plains.

MNHP
S1: At high risk because of extremely limited and potentially declining population numbers or habitat.
S2: At risk because of very limited and potentially declining population numbers or habitat.
BLM Sensitive (S) species are imperiled in at least part of their range and occur on BLM lands.
-*: These species are being proposed for inclusion as sensitive species.
Sources: Cooper et al. 2001; MNHP 2004a; Nora Taylor, personal communication 2006; BLM 2005.

Fish and Wildlife

Fish

Aquatic habitats in the study area include small reservoirs and stock ponds, Wards Reservoir, Glasgow Base Pond, ephemeral streams, and the Milk River. A number of small, shallow, man-made reservoirs and stock ponds occur throughout the study area. As a result of continual disturbance, most support little or no aquatic/emergent vegetation. Some of the larger reservoirs and stock ponds do have a narrow band of emergent wetland vegetation, including cattails (*Typha* spp.) and rushes (*Juncus* spp.). These small reservoirs and stock ponds may support small populations of warm water species, but do not represent important fisheries. Wards Reservoir supports a narrow band of wetland vegetation and contains fathead minnows *(Pimephales promelas*). Glasgow Base Pond is managed as a Fishing Access Site by MFWP and is annually stocked with rainbow trout (*Oncorhynchus mykiss*) and yellow perch (*Perca flavescens*). The small, ephemeral creeks within the study area have little to no flow for most of the year and support limited populations of small fish species. The redbelly dace x finescale dace, which occurs in Cherry Creek, is classified as a BLM sensitive species. The Milk River represents the most significant fishery in the study area. The river supports 28 native and 13 introduced species (Stash et al. 2001).

Reptiles and Amphibians

Five amphibian and nine reptile species have been documented in the vicinity of the study area (Cooper et al. 2001; MNHP 2004b). Five of these species are classified as sensitive species by BLM (Table 3.7-2). There are no known critical breeding habitats or hibernacula for any of these species within or adjacent to the study area.

Mammals

A variety of large and small mammal species occur in the study area. Relatively common grassland species, including mule deer *(Odocoileus hemionus)*, American pronghorn *(Antelocapra americana)*, badger (*Taxidea taxus)*, coyote *(Canis latrans)*, lagomorphs and small rodents, occur throughout the study area. The black-tailed prairie dog (*Cynomys ludovicianus*) does not occur in the study area. Mule deer

occur in low to moderate densities in upland breaks and draws. A recent MFWP study identified an important mule deer winter range along the Canyon Creek and Buggy Creek drainages as well as the break habitats along the northern edge of the Milk River Valley (Pat Gunderson, personal communication 2005). MFWP estimates that approximately 500 individual pronghorn have wintered in the study area in recent years (Pat Gunderson, personal communication 2005). The portion of the Bitter Creek WSA adjacent to the proposed wind farm has also been identified as important mule deer habitat by MFWP. White-tailed deer (*Odocoileus virginianus*) are generally restricted to riparian habitats along the Milk River.

Winter aerial big game surveys were conducted in the project area by the MFWP in January 2005. A total of 4,114 animals were observed during these surveys, including 1,828 mule deer, 1,372 white-tailed deer, 836 pronghorn, and 10 golden eagles. Large concentrations of mule deer were found in the Bitter Creek WSA, the divide between Buggy and Canyon Creeks, lower Buggy Creek, and the Cherry Creek hills north of Glasgow. Although no concentrations of big game were observed within the proposed wind farm, previous studies indicated substantial mule deer use of the southern portion of the wind farm area. Pronghorn were concentrated in three areas: the Dry Fork Creek watershed, east of Britsch Road, and approximately 5 miles due west of St. Marie. White-tailed deer were concentrated in the Milk River Valley.

Little information exists on bats in the study area. Based upon distribution information, eight bat species may occur in the study area (Table 3.7-3). The study area is located at the distributional limits of the Townsend's big-eared bat, western small-footed myotis, and long-legged myotis (Bat Conservation International 2004). All eight species are insectivorous, and may utilize local grasslands and riparian areas as foraging habitat. Bat species that may occur in the study area generally fall into three categories with regard to roosting habitat (Table 3.7-3). There are no known roosts or hibernacula within or in the vicinity of the study area. As there are no caves, abandoned mines, or rock faces/crevices in the study area, it is unlikely that most species roost in the area. There are no known migratory routes or movement corridors between day roosts and foraging habitats in the study area. Based upon the local landscape and the absence of any large hibernacula or roosting complexes, it is unlikely that bats utilize the study area as a major migratory corridor.

Table 3.7-2 Reptile and Amphibian Species Likely to Occur in the Study Area

Common Name	Scientific Name	Habitat	BLM Sensitive
Reptiles			
Tiger salamander	*Ambystoma tigrinum*	Breed in ponds and streams; burrow in prairie or agricultural habitats.	
Greater short-horned lizard	*Phrynosoma hernandesi*	Sparse, short-grass and sagebrush habitats with exposed soils or rock.	X
Painted turtle	*Chrysemys picta*	Lakes and ponds with shallow water, soft substrate, and logs/rocks for basking.	
Western hognose snake	*Heterodon nasicus*	Arid sagebrush and grassland habitats, floodplains with gravelly or sandy soils.	X
Gopher snake	*Pituophis catenifer*	Arid sagebrush and grassland habitats.	
Plains garter snake	*Thamnophis radix*	Numerous, including short-grass prairie near water (ponds and coulees).	
Common garter snake	*Thamnophis sirtalis*	Numerous, prefer moist habitats along streams and ponds.	
Racer	*Coluber constrictor*	Open habitats, particularly common in short-grass prairie.	
Western rattlesnake	*Crotalus viridis*	Open, arid habitats with south-facing slopes and rock outcrops.	
Amphibians			
Great plains toad	*Bufo cognatus*	Pools, stock ponds and stream valleys in sagebrush and grassland habitats.	X
Woodhouse's toad	*Bufo woodhousii*	Floodplains and mesic grasslands with permanent and slow streams.	
Plains spadefoot	*Spea bombifrons*	Sandy and gravelly soils near permanent or temporary bodies of water.	X
Western chorus frog	*Pseudacris triseriata*	Mesic grasslands and marshes near ponds and small lakes.	
Northern leopard frog	*Rana pipiens*	Ponds, creeks, marshes, and wet meadows.	X

Table 3.7-3 Bat Species that May Occur in the Study Area [1]

Common Name	Scientific Name	Roosting Habitat[2]	Status[3]	Migration[4]
Townsend's big-eared bat	*Corynorhinus townsendii*	Caves, abandoned mines	U	Year-round resident
Big brown bat	*Eptesicus fuscus*	Tree cavities, buildings	C	Not known
Silver-haired bat	*Lasionycteris noctivagans*	Tree cavities in mature coniferous/mixed forest	C	Not known
Hoary bat	*Lasiurus cinereus*	Trees	C	Migratory
Western small-footed myotis	*Myotis ciliolabrum*	Caves, abandoned mines, Rock crevices	U	Not known
Long-eared myotis	*Myotis evotis*	Tree cavities and exfoliating bark in mature conifers	U	Not known
Little brown myotis	*Myotis lucifugus*	Buildings, trees, rock crevices	C	Not known
Long-legged myotis	*Myotis volans*	Trees, buildings, rock crevices	U	Likely migratory

Source:
[1] Based upon MNHP distribution data
[2] Primary hibernacula and roost habitats used by the species (Bat Conservation International 2004)
[3] General abundance/distribution in North America: C=common, U=uncommon (Bat Conservation International 2004)
[4] Current knowledge of migration status (MNHP 2004c)

Bat surveys were conducted in August 2005 to evaluate bat presence in the wind farm area (WEST, Inc. 2005). Based upon consultation with BLM and MFWP, mist netting was conducted in the Buggy Creek riparian area and seven ANABAT stations were established throughout the wind farm area. No bats were captured in mist nets, and a total of 257 bat calls were recorded by the ANABAT units. Most calls (255) were recorded at stations near Forsman Reservoir and Buggy Creek. The remaining five ANABAT stations, which were located on higher ridges and along the edge of the Bitter Creek WSA, detected only two calls. Species identified from the ANABAT recordings included big brown bat (*Eptiscus fuscus*), *Lasiurus* spp., and *Myotis* spp.

Birds

A number of upland game birds, waterfowl, shore birds, grassland birds, and raptors inhabit the study area. The Milk River cottonwood gallery forest is the only large tract of forest habitat. The extensive prairies provide habitat for a number of obligate grassland species. The study area does not contain any prominent ridgelines or mountain gaps that would represent a regional migratory pathway, although the area may serve as local pathways as part of large, broad front migration (WEST, Inc. 2004). The area does not attract large numbers of waterfowl. An analysis of NEXRAD data from the Glasgow International Airport failed to identify any large avian migrations through the study area (WEST, Inc. 2006).

Upland game bird species known to occur in the study area include the ring-necked pheasant, greater sage-grouse, and sharp-tailed grouse. All three species were observed in the study area during avian studies (WEST, Inc. 2005). Ring-necked pheasant habitat occurs primarily in the Milk River Valley. The Milk River Valley represents the northernmost extent of big sagebrush in eastern Montana; consequently, the northern portion of the study area provides limited sage-grouse habitat in the form of small, isolated

stringers of silver sagebrush. The sagebrush steppe habitat in the southwest corner of the study area represents the highest quality habitat for sage-grouse in the area (Figure 3.7-2).

The intact native grasslands in the northern portion of the study area provide high quality habitat for sharp-tailed grouse. Several active sharp-tailed grouse leks are located in the northern portion of the study area (Figure 3.7-2).

Although waterfowl were observed during avian surveys, most water bodies in the study area lack emergent/wetland vegetation and do not support extensive waterfowl foraging and nesting. Shore bird species, including the long-billed curlew, marbled godwit, willet, and Wilson's phalarope, were observed during avian surveys and are known to nest in the study area (WEST, Inc. 2005). Habitats for these species include mesic grasslands, wetlands, and riparian areas in the northern portion of the study area.

The intact native mixed-grass prairie in the northern portion of the study area represents relatively high quality habitat for a number of grassland bird species. Avian surveys were conducted to estimate the seasonal and spatial use of the study area by birds. These surveys included observations collected at 12 fixed-point circular plots, systematic line transects and observations made while traveling within the project area. The results of these surveys indicate that the proposed project area represents high quality habitat and supports breeding populations of several obligate grassland bird species that are considered sensitive by BLM and MNHP (WEST, Inc. 2005). A total of 816 individual birds representing 45 species were recorded during fixed-point surveys. The most frequently observed species included the western meadowlark, Sprague's pipit, horned lark, chestnut-collared longspur, and rock pigeon. One large flock of sandhill cranes passed over the study area during the surveys. The most common avian species recorded while traveling within the project area were the Sprague's pipit and western meadowlark. A total of 3,297 individuals representing 56 species were recorded during line transect surveys. The most common group was grassland sparrows, which included the chestnut-collared longspur, horned lark, Sprague's pipit, western meadowlark, and savannah sparrow. Data indicated highest use by the marbled godwit and Wilson's phalarope (large birds) and chestnut-collared longspur, Sprague's pipit, horned lark, western meadowlark and savannah sparrow (small birds).

Given the absence of defined ridges and rim edges in the study area, raptor distribution and habitat use is not significantly influenced by topographic conditions. Relatively steep terrain along the Bitter Creek WSA boundary north and west of the wind farm area could create updrafts used by soaring raptors, and golden eagles were observed foraging in this area during field investigations. Bald eagles are known to roost in the Milk River cottonwood gallery forest and forage in big game winter range in the study area during winter months. A number of raptor species were observed in the grasslands and adjacent Bitter Creek WSA during avian surveys (WEST, Inc. 2005). The most commonly observed raptors included golden eagle, bald eagle, northern harrier, merlin, Swainson's hawk, and red-tailed hawk. Overall raptor use was similar in all seasons, and was relatively low compared to the results of surveys at other wind resource areas. Concentrated sources include one prairie dog town and one waterfowl production area (Wards Reservoir) adjacent to the wind farm area. Raptors are known to forage throughout the area. Carrion in mule deer and pronghorn winter ranges attracts bald eagles and other scavenging raptors (Pat Gunderson, personal communication 2005). Several golden eagles were observed foraging in the Buggy Creek area and Cherry Creek foothills during big game winter surveys (MFWP 2005).

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Figure 3.7-2 Sensitive Biological Resources

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Helicopter surveys conducted within the proposed wind farm area and a 2-mile buffer identified a total of 12 nest structures (WEST, Inc. 2005). The only active nests included a ferruginous hawk nest in Buggy Creek and a red-tailed hawk in upper Canyon Creek. The inactive structures included ferruginous, red-tailed, and Swainson's hawk nests as well as one golden eagle nest. Seven of the inactive nests were located on the Bitter Creek WSA rim or in the extreme southern portion of the wind farm area. Ferruginous hawks are known to construct ground nests in the study area (John Carlson, personal communication 2004), although no ground nests were found during surveys. Bald eagles are not known to nest in the study area (MNHP 2004d), although the Milk River cottonwood gallery forest does represent potential nesting habitat.

Special Status Species

Special status species that could occur in the study area were identified through correspondence with Federal and State agencies. A list of Federally threatened, endangered, proposed and candidate species was obtained from the USFWS. Species designated as regionally sensitive were obtained from the BLM. Montana species of special concern were obtained from the MNHP. As the lists of BLM sensitive species included Montana species of special concern, the BLM species were evaluated for the proposed project. Table 3.7-4 identifies the Federally listed and BLM sensitive species that may occur in the study area, summarizes the habitat requirements of these species, and makes a determination as to the species likelihood of occurrence in the study area. The following discussion presents summaries of each species listed in Table 3.7-4.

Pallid Sturgeon (Federal Endangered)

The pallid sturgeon was listed as endangered in 1990 and a species recovery plan was completed in 1993 (Dryer and Sandvol 1993). The species currently inhabits the Missouri River from the Montana/North Dakota state line to Fort Peck Dam and upstream of Fort Peck Reservoir to Stafford Ferry (Montana Chapter of the American Fisheries Society 2004). Anecdotal evidence suggests that the species historically utilized the Milk River for spawning, with historic reports of sturgeon as far upstream as Glasgow. Pallid sturgeon habitat in the Milk River is currently restricted to the confluence with the Missouri River, and the species does not occur within the study area (Matt Baxter, personal communication 2004).

Black-footed Ferret (Federal Endangered/Non-essential Experimental)

The black-footed ferret was listed as endangered in 1967. The species is a grassland prairie species and an obligate associate of prairie dogs (*Cynomys* spp.), upon which they depend for food and shelter. The only known black-footed ferret population in Montana occurs on the Charles M. Russell National Wildlife Refuge (NWR). There are no prairie dog towns within or in proximity to the study area. The black-footed ferret does not occur in the study area, and this area does not represent potential suitable habitat for the species.

Interior Least Tern (Federal Endangered)

The interior population of least tern was listed as endangered in 1985, and a recovery plan was completed in 1990 (USFWS 1990). The species nests on unvegetated, gravel and sand-pebble substrates along the Missouri River below Fort Peck Dam, on the beaches of Fort Peck Reservoir, and along the Yellowstone River below Glendive (MFWP 2004). There have been no historical reports of the species occurring in the study area and the species was not observed during avian surveys. The interior least tern does not occur in the study area, and this area does not represent potential suitable habitat for the species.

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Table 3.7-4 Special Status Wildlife Species that May Occur in the Study Area

Common Name	Scientific Name	Status[1] USFWS	BLM	MNHP	Habitat Requirements	Likelihood of Occurrence[2]
Amphibians and Reptiles						
Great Plains toad	*Bufo cognatus*	--	X	X	Inhabits prairie grasslands and breeds in vernal pools, ditches, and ponds. Not observed during surveys.	May occur
Greater short-horned lizard	*Phrynosoma hernandesi*	--	X	X	Inhabits short-grass prairie, sagebrush, and rocky/sandy plains; often found under or around sagebrush.	Known to occur
Northern leopard frog	*Rana pipiens*	--	X	X	Inhabits ponds, reservoirs, lakes, creeks, springs, and wetlands.	Known to occur
Plains spadefoot	*Spea bombifrons*	--	X	X	Inhabits short-grass prairie habitats with loose sand/gravel soils. Not observed during surveys.	May occur
Western hognosed snake	*Heterodon nasicus*	--	X	X	Inhabits arid sagebrush-grassland habitats with gravelly or sandy soils. Not observed during surveys.	Likely to occur
Fish						
Pallid sturgeon	*Scaphirhynchus albus*	E		X	Inhabits the Missouri River in vicinity of Fort Peck Reservoir. Does not currently inhabit the Milk River above confluence with the Missouri River	Does not occur
Blue sucker	*Cycleptus elongatus*	--	X	X	Blue sucker larvae and young-of-the-year have been collected from the lower Milk River.	May occur
Northern redbelly dace x Finescale dace	*Phoxinus eos x Phoxinus neogaeus*	--	X	X	Known to occur in Cherry Creek.	Known to occur
Sauger	*Stizostedion canadense*	--	X	X	Known to occur in the Milk River.	Known to occur
Mammals						
Black-footed ferret	*Mustela nigripes*	E/XN	--	X	Obligate associate of prairie dogs and inhabits prairie dog towns.	Does not occur
Long-eared myotis	*Myotis evotis*	--	X		Forages in wooded riparian habitats and roosts in buildings, rock crevices, abandoned mines, and trees. Not captured/recorded during bat surveys.	May occur
Townsend's big-eared bat	*Corynorhinus townsendii*	--	X	X	Forages forested habitats and roosts in caves, buildings, bridges, rock crevices, and trees. The study area is at the limit of the species range. Not captured or recorded during bat surveys.	May occur
Swift fox	*Vulpes velox*	--	X	X	Inhabits grassland prairie habitats. Observed and captured during surveys.	Known to occur
Birds						
Interior least tern	*Sterna antillarum athalassos*	E	--	X	Nests on unvegetated, gravel and sand-pebble substrates along the Yellowstone and Missouri Rivers.	Does not occur
Whooping crane	*Grus americana*	E	--	X	Study area is on periphery of migratory corridor; species could potentially fly over the area during seasonal migrations. Not observed during surveys.	May occur during migrations.
Bald eagle	*Haliaeetus leucocephalus*	T	--	X	Utilize the Milk River cottonwood gallery forest and big game winter ranges during winter months.	Known to occur

Table 3.7-4 Special Status Wildlife Species that May Occur in the Study Area (Continued)

Common Name	Scientific Name	Status[1] USFWS	BLM	MNHP	Habitat Requirements	Likelihood of Occurrence[2]
Piping plover	*Charadrius melodus*	T	--	X	Inhabits open shorelines of lakes, reservoirs, rivers, or wetlands. Breeds along the Missouri River below Fort Peck Dam and along the Fort Peck Reservoir. Not observed during surveys.	Does not occur
Mountain plover	*Charadrius montanus*	--	X	X	Inhabits flat grassland or shrub-steppe habitats, particularly heavily grazed sites and prairie dog towns. Not observed during surveys.	Not likely to occur
Greater sage-grouse	*Centrocercus urophasianus*	--	X	X	Sagebrush obligate species.	Known to occur
Black tern	*Chilodonias niger*	--	X	X	Nest in shallow, freshwater wetland complexes >20 ha with dense stands of bulrush or cattail. Not observed during surveys.	May occur
Burrowing owl	*Athene/Speotyto cunicularia*	--	X	X	Inhabits open prairie grasslands and occupies abandoned burrows.	Known to occur
Ferruginous hawk	*Buteo regalis*	--	X	X	Inhabits prairie grasslands and sagebrush steppe habitats.	Known to occur
Golden eagle	*Aquila chrysaetos*	--	X	X	Inhabits a variety of open and semi-open habitats, including shrublands, grasslands, sagebrush steppe. Observed during field investigations.	Known to occur
Loggerhead shrike	*Lanius ludovicianus*	--	X	X	Inhabits grassland prairies with scattered trees, riparian areas or woody draws. Observed during surveys.	Known to occur
Long-billed curlew	*Numenius americanus*	--	X	X	Inhabits short-grass prairie communities. Observed during surveys.	Known to occur
Chestnut-collared longspur	*Calcarius ornatus*	--	X	X	Inhabits mesic, dense prairie habitats. Observed during surveys.	Known to occur
McCown's longspur	*Calcarius mccownii*	--	X	X	Inhabits short-grass prairie habitats. Observed during surveys.	Known to occur
Marbled godwit	*Limosa fedoa*	--	X	X	Inhabits native prairie habitats with wetlands. Observed during surveys.	Known to occur
Baird's sparrow	*Ammodramus bairdii*	--	X	X	Nests in native prairie grasslands. Observed during surveys.	Known to occur
Brewer's sparrow	*Spizella breweri*	--	X	X	Sagebrush obligate species. Observed during surveys.	Known to occur
Sprague's pipit	*Anthus spragueii*	--	X	X	Inhabits native prairie grasslands. Observed during surveys.	Known to occur
Swainson's hawk	*Buteo swainsonii*	--	X	X	Inhabits a variety of open habitats and nests in isolated trees. Observed during surveys.	Known to occur
Willet	*Catoptrophorus semipalmatus*	--	X	X	Inhabits wetland habitats interspersed with prairie grasslands. Observed during surveys.	Known to occur
Wilson's phalarope	*Phalaropus tricolor*	--	X	X	Inhabits wetlands with open water and emergent vegetation. Observed during surveys.	Known to occur
Red-headed woodpecker	*Melanerpes erythrocephalus*	--	X	X	Inhabits open forests and woodlots with relatively low tree densities. Reported observations from Milk River gallery forest	Known to occur

[1] USFWS: E=Endangered, T=Threatened; C=Candidate; E/XN=Endangered/Non-essential Experimental
BLM: Montana/Dakotas Sensitive Species list
MNHP: Species of Concern list
[2] Based upon species distribution, habitat requirements, historic observations, and field investigations

Whooping Crane (Federal Endangered)

The whooping crane was listed as endangered in 1970 and a recovery plan was completed in 1994 (USFWS 1994). This species does not breed or nest in Montana (Johnsgard 1986), but individuals occasionally stop over at Medicine Lake NWR during their migration. The study area is located at the western edge of the species' migratory corridor. Observations of whooping cranes in the vicinity of the study area have included one individual near Whitewater in March 1990, two individuals near Fort Peck in 1994, and one individual southwest of Glasgow in April 2003. There have been no recorded sightings within or near the study area, and no whooping cranes were observed during avian surveys. During migration, whooping cranes typically forage in stubble fields and wet meadows near safe roosting sites. Foraging and roosting habitats are limited in the study area, although previous sightings in the general region suggest that whooping cranes could occasionally fly over the study area during seasonal migrations. The species generally flies from 1,000 to 5,000 feet above ground level during migrations (WEST, Inc. 2004). The probability of occurrence in the study area is low.

Bald Eagle (Federal Threatened)

The bald eagle was listed as threatened in 1978. Bald eagles are transient, winter occupants in the Glasgow area. Although the largest eagle concentrations occur below Fort Peck Dam (MNHP 2004d), they roost along the Milk River and scavenge in big game winter range during winter months (John Carlson, personal communication 2004; Pat Gunderson, personal communication 2005). Several eagles were observed in the study area during avian studies (WEST, Inc. 2005). Bald eagles do not nest in the study area, although the Milk River cottonwood gallery forest does represent potential nesting habitat.

Piping Plover (Federal Threatened)

The piping plover was listed as threatened in 1985 and critical habitat was designated in 2002. In Montana, the piping plover nests on open shorelines along lakes, reservoirs, rivers, and wetlands. In the vicinity of the study area, the species is known to breed along the Missouri River below Fort Peck Dam and Fort Peck Reservoir. A portion of the Charles M. Russell NWR has been designated as critical habitat. Plovers have also been observed at reservoirs near Malta, Montana. There have been no historical reports of the species occurring in the study area and the species was not observed during avian surveys. The piping plover does not occur in the study area, and this area does not represent suitable habitat for the species.

Great Plains Toad (BLM Sensitive)

The Great Plains toad inhabits prairie grasslands, where toads spend the day burrowed under soil, rocks, or thick grass and breed in vernal pools, flooded ditches, small reservoirs, and stock ponds after heavy summer rains. While Great Plains toads were not observed during field investigations, the northern portion of the study area provides suitable habitat for this species.

Plains Spadefoot (BLM Sensitive)

The plains spadefoot inhabits short-grass prairies with loose sandy or gravelly soils in the vicinity of water. This species remains in underground burrows for much of each year, except when adults emerge and breed in ponds, water tanks, and seeps following heavy rains. While plains spadefoot were not observed during field investigations, the northern portion of the study area provides suitable habitat for this species.

Northern Leopard Frog (BLM Sensitive)

Northern leopard frog habitat includes ponds, creeks, springs, and wetlands. Adults and juveniles commonly feed in open wet meadows and along the margins of water bodies. The northern leopard frog occurs in the study area and was observed during field investigations.

Greater Short-Horned Lizard (BLM Sensitive)

The greater short-horned lizard inhabits semi-arid, short-grass prairie, sagebrush, and open rocky/sandy plains. The greater short-horned lizard is known to occur in the study area.

Western Hognose Snake (BLM Sensitive)

The western hognose snake inhabits arid sagebrush-grassland habitats, particularly those with gravelly or sandy soils. The species is considered a specialist predator on toads, but would also eat small mammals, birds, eggs, frogs, salamanders, and other snakes. The western hognose snake was not observed during field investigations, but suitable habitat exists throughout the study area.

Blue Sucker (BLM Sensitive)

The blue sucker congregates in the major tributaries of the Missouri River, including the Milk River. Blue sucker larvae and young-of-the-year have been collected from the lower Milk River. Due to the species' preference for swift water habitats, the Milk River does not represent year-round habitat for the blue sucker, but the species may occur in the study area.

Northern Redbelly Dace x Finescale Dace (BLM Sensitive)

This hybrid survives in low-oxygen aquatic environments. There is one historic observation of the northern redbelly x finescale dace in Cherry Creek, and the species is known to occur in the study area (MNHP 2004e).

Sauger (BLM Sensitive)

The sauger is known to occur in that portion of the Milk River that traverses the study area (Bill Wiedenheft, personal communication 2005).

Long-Eared Myotis (BLM Sensitive)

In the Great Plains region, the long-eared myotis primarily forages in wooded riparian habitats. Maternity roosts include buildings, rock crevices, and hollow trees, and hibernacula include caves and abandoned mines. Although two individuals were discovered hibernating in Richland County, the species is considered to be migratory. No information exists on the species status in the study area, and the species was not detected during bat surveys. Although the study area is located at the edge of the species range (MNHP 2004c), the long-eared myotis could occur in the wooded riparian habitats along the Milk River.

Townsend's Big-Eared Bat (BLM Sensitive)

The Townsend's big-eared bat is a cave-dwelling species that occurs in shrub-steppe and forested habitats, including cottonwood gallery forests. The species roosts in buildings, bridges, rock crevices, and hollow trees and hibernates in caves and abandoned mines. The study area is located at the edge of the species range (Bat Conservation International 2004), and the nearest verified observation is approximately 100 miles southwest of the study area (Hendricks 1998). There are no large caves or abandoned mines in the study area that could provide hibernacula. Although no Townsend’s big-eared bats were detected during bat surveys, the species could occur in the wooded riparian habitats along the Milk River.

Swift Fox (BLM Sensitive)

Swift fox habitat consists of large blocks of native prairie grasslands (>10,000 acres) with flat topography and limited agricultural activity (Giddings and Knowles 1995). MFWP conducted systematic swift fox surveys in the six townships within and adjacent to the project area in 2005. Four swift fox (two adult males, one adult female, and one juvenile female) were captured, including one in the proposed wind farm area. Additionally, a pair of swift fox was observed in the central portion of the wind farm area during avian surveys.

Mountain Plover (BLM Sensitive)

The mountain plover inhabits flat sparse short-grass prairie or shrub-steppe habitats and avoids areas with irregular terrain, dense vegetation, or wet soils (USFWS 2002). Nests are constructed on barren ground, typically in heavily grazed areas or prairie dog towns. The only known breeding habitat for mountain plover in Valley County is in the vicinity of Little Beaver Creek, approximately 20 miles southeast of Glasgow (FaunaWest 1995). There are no historical reports of the species occurring in the study area and the species was not observed during avian surveys. As the study area possesses little potential nesting habitat (i.e., prairie dog towns), the mountain plover does not occur in the study area.

Greater Sage-Grouse (BLM Sensitive)

The greater sage-grouse occurs throughout the study area. The species is a sagebrush obligate, with winter habitat consisting of big sagebrush communities and summer habitats consisting of riparian areas and mesic grasslands (Connelly et al. 2004). The Milk River Valley represents the northernmost extent of big sagebrush in Montana (Montana Sage-grouse Work Group 2004). Greater sage-grouse habitat north of the Milk River consists of small, isolated stringers of silver sagebrush, and sage-grouse occur in low densities in the northern portion of the study area. The sagebrush steppe habitat in the southwestern corner of the study area supports big sagebrush, and represents the highest quality sage-grouse habitat in the area. Lek surveys conducted by MFWP identified a total of four active greater sage-grouse leks in the study area (Figure 3.7-2). Three of these were historic leks located approximately 5 miles south of the proposed wind farm. One new lek was discovered in the Bitter Creek WSA approximately 4 miles west of the proposed wind farm area. The results of the lek surveys indicate that the wind farm area does not provide quality habitat for greater sage-grouse. A total of six active leks were identified in the sagebrush steppe habitat in the southwest corner of the study area.

Black Tern (BLM Sensitive)

The black tern is a migratory summer resident that nests in shallow, freshwater wetland complexes (>50 acres) with emergent vegetation. Breeding colonies consist of dense cattail stands. Records indicate that transient black terns have been observed in the general Glasgow area, but there is no evidence of breeding in this area (MNHP 2004f). There are no large wetland complexes with extensive emergent vegetation in the study area, and no black terns were observed during avian surveys (WEST, Inc. 2005). Although there is an absence of suitable habitat, the black tern may occur in the study area.

Burrowing Owl (BLM Sensitive)

The burrowing owl inhabits open prairie grasslands, where individuals occupy abandoned burrows dug by ground squirrels (*Spermophilus* spp.), prairie dogs (*Cynomys* spp.), and badgers. Although there are no prairie dog towns or large ground squirrel colonies in the study area, burrowing owls were observed during avian surveys. Given the limited number of available animal burrows, the burrowing owl likely occurs in low densities in the study area.

Ferruginous Hawk (BLM Sensitive)

The ferruginous hawk inhabits mixed-grass prairie, sagebrush-grassland, and sagebrush steppe habitats, where it builds large stick nests in trees, cliff ledges, and on the ground. Ferruginous hawks were observed during avian surveys, and one active ferruginous hawk nest and several inactive nests were discovered in the wind farm area (WEST, Inc. 2005). The BLM has also reported active ground nests in the northern portion of the study area (John Carlson, personal communication 2004), although no ground nests were discovered during field investigations.

Golden Eagle (BLM Sensitive)

The golden eagle occurs in a variety of open and semi-open habitats in Montana, including shrublands, grasslands, sagebrush steppe, and coniferous forests. Nests are typically constructed on cliffs and in large trees. The golden eagle preys upon small mammals and birds and forages for carrion on big game winter

ranges. Golden eagles were observed during avian surveys, and one inactive golden eagle nest was identified in the wind farm area (WEST, Inc. 2005).

Loggerhead Shrike (BLM Sensitive)

The loggerhead shrike inhabits a variety of open habitats including grasslands with scattered trees, riparian areas, woody draws, sagebrush-steppe, and badland shrub communities. One loggerhead shrike was observed during avian surveys, and suitable habitat occurs throughout the study area.

Long-Billed Curlew (BLM Sensitive)

The long-billed curlew inhabits short-grass prairie communities and requires large blocks of grasslands with diverse foraging habitats. Numerous long-billed curlews were observed in the wind farm area during avian surveys. The highest quality curlew habitat is located in the northern portion of the study area.

Chestnut-Collared Longspur (BLM Sensitive)

The chestnut-collared longspur prefers sparse grasslands in native mixed-grass prairie habitats. The species was observed during avian surveys and was the most commonly observed songbird species in the wind farm area. The northern portion of the study area provides high quality habitat and supports a breeding population of chestnut-collared longspur.

McCown's Longspur (BLM Sensitive)

The McCown's longspur inhabits short-grass prairie communities with sparse vegetation cover. The species prefers more xeric habitats with shorter vegetation than the chestnut-collared longspur. The McCown's longspur was observed during avian surveys, with high quality habitat occurring in the wind farm area.

Marbled Godwit (BLM Sensitive)

The marbled godwit inhabits native grassland prairie habitats interspersed with wetlands. Nest sites are typically located in short-grass prairie wetlands. The marbled godwit was observed during avian surveys, and analysis of the survey data indicated the species had one of the highest use values. The highest quality habitat is located in the northern portion of the study area.

Baird's Sparrow (BLM Sensitive)

The Baird's sparrow nests in native prairie grasslands that are lightly grazed and have minimal shrub cover. The species was observed during avian surveys, and the highest quality habitat is located in the northern portion of the study area.

Brewer's Sparrow (BLM Sensitive)

The Brewer's sparrow is associated with short-grass prairie and shrub-steppe habitats. The species was observed during avian surveys, and the best habitat occurs in the southern portion of the study area.

Sprague's Pipit (BLM Sensitive)

The Sprague's pipit inhabits native prairie grasslands with moderate vegetation density. The species was one of the most commonly observed species during avian surveys. The highest quality habitat for the Sprague's pipit is located in the wind farm area.

Swainson's Hawk (BLM Sensitive)

The Swainson's hawk utilizes a variety of open habitats, including prairie grasslands, sagebrush, shrub-steppe, farmlands, and deserts. Within these habitats, the species utilizes scattered, isolated trees for nesting. The Swainson's hawk was observed during field investigations. Two inactive nests, one in the Bitter Creek WSA and one in the southeast portion of the wind farm, were discovered during raptor nest

surveys. The highest quality habitat for the Swainson's hawk is located in the northern portion of the study area.

Willet (BLM Sensitive)

The willet inhabits mosaic wetland habitats interspersed with short- and mixed-grass prairie, nesting near open water in marshes and wet meadows. The species was observed during field investigations, and the highest quality habitat occurs in the northern portion of the study area.

Wilson's Phalarope (BLM Sensitive)

The Wilson's phalarope inhabits freshwater wetlands that contain open water, emergent vegetation, and open shoreline, and nests in wetlands and grasslands. The Wilson's phalarope was one of the most commonly observed species during avian surveys. The highest quality habitat for the Wilson's phalarope is located in the northern portion of the study area.

Red-Headed Woodpecker (BLM Sensitive)

The red-headed woodpecker inhabits open forests that contain snags for nesting and herbaceous ground cover for foraging. In Montana, the species typically inhabits riparian gallery forests along major rivers. No red-headed woodpeckers were observed during field investigations, but there are recorded observations of the species along the Milk River cottonwood riparian forest in the study area. The red-headed woodpecker is known to occur in the southern portion of the study area.

Project Area

Wind Farm Overview

The proposed wind farm area consists of a large plateau that is bisected by several coulees and small drainages. The northern and western portions of the wind farm are located adjacent to the Bitter Creek WSA, which sits approximately 300 feet lower in elevation and is separated by a distinct rim and eroded breaks. Vegetative communities include extensive native short- and mid-grass prairie intermixed with small patches of badland, shrubland, and riparian vegetation. There are also a number of agricultural fields in the wind farm area. Native prairie grassland species include western wheatgrass, thickspike wheatgrass, needle-and-thread, and blue grama. Mesic swales and north-facing slopes also support northern porcupine grass and green needlegrass. Silver buffaloberry is the primary shrub species in the upland draws, which also include common chokecherry, skunkbush, Wood's rose, and western snowberry. Leafy spurge occurs along the western edge of the wind farm area (MNRIS 2004).

The wind farm area supports a variety of grassland wildlife species. Avian surveys identified breeding populations of a number of obligate grassland bird species in the wind farm area including several that are classified as sensitive by the BLM (Table 3.7-4). The area does not represent a migratory corridor of continental or regional significance based upon local physiographic characteristics (WEST, Inc. 2004). The wind farm area represents relatively high quality habitat for sharp-tailed grouse, and a number of leks have been identified within and adjacent to this area (Figure 3.7-2). A variety of raptors are known to nest and forage in the wind farm area, although overall raptor numbers were lower than at other wind farm sites in the western U.S. (WEST, Inc. 2005). Several large and small grassland mammal species (i.e., mule deer, pronghorn, swift fox, badger, jackrabbit, ground squirrel) inhabit the area, as do terrestrial reptiles and amphibians.

Phase I

The Phase I area encompasses 1,094 acres on an upland plateau immediately adjacent to the Bitter Creek WSA. Vegetation in this area consists of intact native prairie (881 acres) with a limited amount of cultivated cropland (213 acres). Small livestock ponds and wetlands occur throughout the Phase I area, and a small drainage is located in the southern portion of this phase. Leafy spurge is present in the northern and central portions of Phase I (MNRIS 2004). The Phase I area provides habitat for a diversity

of grassland bird, raptor, and mammal species, including a number of special status species presented in Table 3.7-4. The southern portion of this area contains approximately 464 acres of mule deer winter range (Figure 3.7-2). One sharp-tailed grouse lek is known to occur in the Phase I area (Figure 3.7-2).

Phase II

Phase II encompasses 2,800 acres in the west-central portion of the wind farm. Vegetative communities in the Phase II area are extremely similar to the Phase I area, and are predominantly intact native prairie (2,268 acres) with a small amount of cultivated cropland (532 acres). Small livestock ponds and wetlands occur throughout the Phase II area. This area encompasses the extreme upper reaches of the Buggy Creek watershed, and contains small patches (<0.1 acre) of upland shrubs. No noxious weeds are known to occur in the Phase II area (MNRIS 2004). The area provides habitat for a diversity of grassland bird, raptor, and mammal species, including a number of special status species presented in Table 3.7-4. Phase II contains 685 acres of mule deer winter range. No sharp-tailed grouse leks are known to occur in the Phase II area.

Phase III

Phase III bounds the Bitter Creek WSA and encompasses 5,520 acres of native prairie (5,163 acres) and cultivated cropland (357 acres). Small livestock ponds and wetlands occur in both sections of Phase III. The northwest corner of this section contains a relatively large draw with upland shrub communities. The eastern edge of this area encompasses a series of draws associated with the Buggy Creek drainage. No noxious weeds are known to occur in this portion of Phase III (MNRIS 2004). The Phase III area provides habitat for a diversity of grassland bird, raptor, and mammal species, including a number of special status species presented in Table 3.7-4. The large draw and associated breaks in the northern section of Phase III represent mule deer winter range (771 acres) as does most of the southern portion of this phase (668 acres). One sharp-tailed grouse lek is known to occur in the Phase III area (Figure 3.7-2).

Phase IV

Phase IV encompasses 10,706 acres and includes several upland plateaus and small coulees. This phase encompasses approximately 4.7 miles of the upper reaches of Buggy Creek and the headwaters of Canyon Creek. Numerous small livestock ponds and wetlands occur throughout this phase. Vegetation in Phase IV is predominantly native prairie interspersed with small patches of upland shrub and riparian habitats along the Buggy Creek and Canyon Creek drainages. The most significant riparian zone occurs along Buggy Creek, which transitions from relatively xeric snowberry communities to herbaceous vegetation (0.4 linear miles) to shrub vegetation (0.5 linear miles) to cottonwood gallery forest (0.2 linear miles) as one moves south along the drainage. Silver sagebrush-western wheatgrass communities occur on terraces immediately above the riparian zones. Leafy spurge is known to occur in the southwest corner of this phase (MNRIS 2004). The Phase IV area provides habitat for a number of special status species presented in Table 3.7-4. The southern portion of this phase (5,933 acres) encompasses mule deer winter range. Although no sharp-tailed grouse leks were identified in the Phase IV area, the species has been observed throughout this area. The silver sage communities along Buggy Creek and Canyon Creek represent suitable habitat for greater sage-grouse.

Transmission Route C

Vegetation

The corridor of Transmission Route C is dominated by native short- and mid-grass prairie communities interspersed with patches of agriculture, upland shrubs, sagebrush steppe, and riparian vegetation (Figure 3.7-1). This route crosses the Buggy Creek drainage approximately 2 miles south of the Northern Border Compressor Station. At the crossing location, the drainage is relatively broad with a narrow band (approximately 20 feet wide) of herbaceous/shrub riparian vegetation. The corridor also crosses a narrow band of snowberry in the Wolf Creek drainage approximately 3 miles south of the Buggy Creek crossing. At the crossing of the Milk River, Route C passes through approximately 150 linear feet of cottonwood

gallery forest. A small amount of sagebrush steppe vegetation occurs adjacent to the proposed Antelope Creek Substation. No species of concern are known to occur in the vicinity of the Route C corridor, although surveys have not been conducted along this corridor. Leafy spurge is known to occur along this route and spotted knapweed has been documented in the vicinity (MNRIS 2004).

Wildlife

The northern portion of Route C traverses relatively contiguous native grassland communities and habitat types that support a number of birds, mammals, reptiles, and amphibians, including numerous special status species listed in Table 3.7-4. Sensitive wildlife resources along Transmission Route C include sage-grouse and sharp-tailed grouse habitats, mule deer winter range, and riparian cottonwood forest that represents suitable bald eagle roosting habitat. These resources are summarized in Table 3.7-5.

Table 3.7-5 Sensitive Wildlife Resources Along Transmission Line Route Alternatives

Resource	Route C	Route A
Total length (miles)	34.1	41.5
Active sharp-tailed grouse leks within 1 mile	1	2
Active sharp-tailed grouse leks within 2 miles	3	3
Linear miles within 2 miles of sharp-tailed grouse lek	3.3	5.3
Active sage-grouse leks within 1 mile	0	0
Active sage-grouse leks within 2 miles	1	0
Linear miles within 2 miles of sage-grouse lek	2.5	0.0
Linear miles traversing mule deer winter range	5.6	0.0
Linear miles traversing riparian cottonwood habitat	0.06	0.06
Linear miles traversing riparian shrub habitat	0.77	0.42

Transmission Route A

Vegetation

The corridor of Transmission Route A is dominated by native short- and mid-grass prairie communities, with patches of agriculture, upland shrubs, sagebrush steppe, and riparian vegetation. Approximately 2 miles south of the Northern Border Compressor Station, this route crosses the Buggy Creek drainage. At this location, Buggy Creek is a relatively broad drainage with a narrow band (approximately 20 feet wide) of herbaceous/shrub riparian vegetation. Route A crosses through some small, narrow bands of cottonwood riparian forest along Cherry Creek in the vicinity of Skylark Road. Where the Route A corridor crosses the Milk River, it passes through approximately 150 linear feet of cottonwood gallery forest. The remainder of the corridor traverses primarily agricultural lands with the exception of a small area of sagebrush steppe vegetation adjacent to the proposed Antelope Creek Substation. No noxious weeds are known to occur in the vicinity of the Route A corridor (MNRIS 2004).

Chaffweed, a BLM Watch Species, was discovered on State lands in the Dry Fork Creek area in 2000. This community is located on the north side of Dry Fork Creek and is northeast of the Route A corridor. Information obtained from the MNHP indicates that approximately 10 miles of this route may potentially

cross through an extensive tract of northern porcupine grass-thickspike wheatgrass, a community that is considered important by the MNHP. A historical observation of poison suckleya, a Montana Species of Concern, was documented in the Milk River Valley near Glasgow in 1900. No rare plant surveys have been conducted along the Route A corridor.

Wildlife

As indicated by the description of vegetation, Route A is very similar to Transmission Route C. Habitat types crossed by this corridor support a number of birds, mammals, reptiles, and amphibians, including numerous special status species listed in Table 3.7-4. The primary differences are that Route A traverses more sharp-tailed grouse habitat and less sage-grouse habitat and does not cross through mule deer winter range.

Antelope Creek Substation

The dominant vegetative community in the vicinity of the proposed substation is Wyoming big sagebrush-western wheatgrass. No special status plants or noxious weeds are known to occur in this area. Wildlife habitat in the vicinity of the substation site is relatively low quality as a result of livestock grazing, the existing substation and power lines, and the presence of Billingsley Road. Although pronghorn were observed in the area during field surveys, the area does not provide suitable habitat for most special status species. The nearest active greater sage-grouse lek is located approximately 2 miles west of the substation site (Figure 3.7-2).

3.7.2 Environmental Consequences

Introduction

Methods

This section describes the impacts to biological resources that could occur as a result of construction, operation, and maintenance of the wind farm, transmission line, and substation. Specific mitigation measures are proposed to minimize adverse impacts to biological resources. In order to determine impact intensity, the impact assessment methodology that was applied to biological resources considered the factors described in Section 3.1.

Impact Criteria

Impacts to biological resources are classified as **High** if the action would result in: the irretrievable or irreversible loss of a plant Species of Concern; a Federally-listed, proposed candidate species, or State-listed sensitive species would be adversely affected; the “take” of a Federally-endangered, threatened, proposed, or candidate wildlife species; direct mortality that results in population-level effects to a relatively common wildlife species; habitat loss resulting in higher mortality or lower reproductive success for an entire species; permanent loss of leks or an entire winter range; the destruction of a riparian area providing habitat for rare plant or animal species or populations; or the establishment of new, or increases in, populations of noxious or invasive plants.

Impacts are classified as **Moderate** if the action would result in: disturbance of a Federally-endangered, threatened, proposed, or candidate wildlife species during a critical period; mortality of common wildlife species not resulting in population-level effects; short-term inability to use leks or winter range; permanent loss of habitat or reduction in population viability for a BLM sensitive species or state Species of Concern; removal of mature trees in a cottonwood gallery forest; or elimination of a native plant community.

Impacts are classified as **Low** if the action would result in: effects to a Federally-endangered, threatened, proposed, or candidate wildlife species that could be mitigated; a limited amount of direct mortality to a

relatively common wildlife species (e.g., jackrabbit); short-term loss of habitat for a BLM sensitive species or state Species of Concern; or a small permanent loss of common native plant communities.

Impact Types

Adverse impacts to biological resources are associated with construction, operation, and maintenance activities of the proposed wind farm, transmission line, and substation. Adverse impacts to vegetation are associated with injury and mortality of plants, generation of fugitive dust, exposure to contaminants, establishment and increase in noxious weeds and invasive plants, the increased potential for public access, and risk of wildfire. Primary adverse impacts to wildlife include direct mortality, habitat loss and fragmentation, disturbance and displacement of individual animals, interference with behavioral activities, and increased public access. Table 3.7-6 presents a summary of impact types. Particular attention has been placed on important vegetative communities and wildlife habitats within the study area, including intact native prairie grasslands, mule deer and pronghorn winter range, greater sage-grouse and sharp-tailed grouse leks and winter habitat, and mature riparian cottonwood forests. Specific details of the mitigation measures proposed to reduce potential impacts to biological resources are discussed in Appendix A.

No Action

Under the No Action Alternative, the project would not be constructed or operated. There would not be any alteration to the lands; therefore, no impacts to vegetation or wildlife would occur as a result of the project. However, development of a different nature could occur in Valley County. Depending on the location, type, and magnitude for future development at the project site, impacts on vegetation, wildlife, or threatened or endangered plant and animal species could be similar to or even greater than the Proposed Action.

Proposed Action

Wind Farm

Vegetation

Clearing, grading, and construction would result in the permanent and temporary loss of vegetation. Permanent vegetation loss would result from removal of vegetation at the following sites: turbines, support buildings, parking areas, and access roads. Temporary disturbance would result from overland travel and equipment laydown at staging areas. Table 3.7-7 presents estimates of permanent and temporary disturbance by vegetation type for each phase of the wind farm. Permanent loss of vegetation would be minimized by limiting the area of physical ground disturbance and by reseeding all disturbed areas with native grasses, forbs, and shrubs upon completion of construction activities. Although no rare or sensitive plant species are known to occur in the wind farm area, pre-construction surveys would be conducted to verify presence/absence of sensitive plant species and communities. BLM would be notified of survey locations and any positive findings for sensitive plant species. All sensitive plants/communities would be delineated with flagging or fencing, and construction personnel would be instructed to avoid all such marked areas.

Leafy spurge is known to occur in the wind farm area (and adjacent Bitter Creek WSA). Physical ground disturbance, construction vehicles, and increased public access could facilitate the establishment and spread of noxious and invasive plants. The establishment of noxious/invasive vegetation could be limited by early detection and eradication. A survey would be conducted prior to each phase of construction to identify and map the locations of noxious weeds and invasive plants as part of the Noxious Weed and Invasive Plant Control Plan (Appendix C). Specific control measures identified in this plan include: cleaning construction vehicles; reseeding disturbed areas with a certified weed-free mixture of native grasses, forbs, and shrubs; using certified weed-free mulch; and annual post-construction monitoring and treatment of access roads and tower sites for a period of five years following each phase of construction or longer as determined by the agencies.

Fugitive dust generated during clearing, grading, and vehicle travel could adversely affect vegetation. However, fugitive dust generation would be short-term and localized to the immediate area of construction. Control measures would be implemented to minimize fugitive dust emissions from construction-related traffic and ground disturbance. (see Section 3.15). Vegetation could also be exposed to contaminants as a result of accidental spills of fuels and other hazardous materials during construction. These impacts would be localized to the spill location. A spill prevention and control plan would be prepared to minimize the potential for spills and to develop a protocol for cleaning up any accidental spills. (see Section 3.13).

The construction of access roads could result in increased public access and increased potential for wildfires, which could be ignited by hot engine parts, careless cigarette use, and campfires. The potential for wildfires would be greatest in summer and autumn when native grasses have died back and fuel loads are at their greatest. To limit new or improved access into the area, all new access roads that are undesired or not required for maintenance would be closed, thereby decreasing the potential for noxious weeds/invasive vegetation spread and wildfire ignition. Additionally, a comprehensive fire control plan would be prepared prior to construction.

Table 3.7-6 Summary of General Impact Types

Impact Type	Associated Activity	Potential Impacts	Duration	Project Component		
				Wind Farm	Transmission Line	Substation
Construction						
Permanent ground disturbance	Site clearing and grading for turbines and access roads	Destruction of vegetation; habitat loss and fragmentation	Long-term	X	X	X
Temporary ground disturbance	Equipment/materials staging and construction vehicles	Crushing of vegetation and reduced habitat quality	Short-term	X	X	X
Generation of fugitive dust	Site clearing and grading, construction vehicles	Potential adverse effects to plants and wildlife in immediate vicinity	Short-term/ localized	X	X	X
Exposure to contaminants	Accidental release of fuel or hazardous materials	Potential adverse effects to plants and wildlife in immediate vicinity	Short-term/ localized	X	X	X
Invasive/Noxious plants	Site clearing and grading for turbines and access roads	Establishment of invasive and noxious plant species	Long-term	X	X	X
Wildfire	Construction equipment, and public access on project roads	Loss of native vegetation and wildlife habitat, establishment of invasive/noxious plants	Long-term	X	X	
Permanent and temporary ground disturbance	Site clearing and grading for turbines and access roads	Mortality and injury of wildlife species that burrow or have limited mobility; destruction of bird nests	Short-term/ localized	X	X	X
Human activity and noise	Site preparation and construction; vehicle traffic	Disturbance and displacement of wildlife species; avoidance of habitats in vicinity of activity; interruption of foraging, migration, and breeding behaviors	Short-term/ localized	X	X	X

Table 3.7-6 Summary of General Impact Types (Continued)

Impact Type	Associated Activity	Potential Impacts	Duration	Project Component: Wind Farm	Project Component: Transmission Line	Project Component: Substation
Operation and Maintenance						
Annual maintenance	Mowing and clearing	Destruction of vegetation; habitat loss; establishment of invasive plants	Short-term/ localized	X	X	
Generation of fugitive dust	Occasional maintenance traffic	Potential adverse effects to plants and wildlife in immediate vicinity	Short-term/ localized	X	X	
Exposure to contaminants	Accidental release of fuel from maintenance vehicles	Potential adverse effects to plants and wildlife in immediate vicinity	Short-term/ localized	X	X	X
Invasive/Noxious plants	Vehicle traffic on access roads	Establishment of invasive/noxious plants; potential impacts to native vegetation and wildlife	Long-term	X	X	X
Wildfire	Vehicle traffic on access roads	Loss of native vegetation and wildlife habitat, establishment of invasive/noxious plants	Long-term	X	X	X
Collision with turbines and transmission line	Turbine operation and presence of transmission line	Mortality and injury of avian and bat species	Long-term	X	X	X
Noise, presence of structures, and human activity	Turbine operation; presence of turbines and transmission line structures; maintenance traffic	Disturbance and displacement of wildlife species; avoidance of habitats in vicinity of activity	Long-term	X	X	X
Increased perdition	Transmission line structures used as perches by raptors	Mortality of prey species	Long-term		X	
Increased public access	Construction of new roads	Increased legal and illegal take of wildlife; disruption of foraging, breeding, and migratory behaviors; establishment of invasive/noxious plants	Long-term	X	X	

Decommissioning

Impacts would be similar to those listed under Construction. All impacts would be short-term, except for Permanent Ground Disturbance.

Source: Adapted from USDI 2005

Table 3.7-7 Native Vegetation Disturbance Associated with the Proposed Wind Farm (acres)

	Phase I	Phase II	Phase III	Phase IV	Total Area
Permanent					
Native mixed-grass prairie	14.0	15.0	29.1	22.9	81.0
Native prairie with silver sage	0	0	0	7.8	7.8
Breaks	0	1.0	0.3	11.3	12.6
Total	14.0	16.0	29.4	42	101.4
Temporary					
Native mixed-grass prairie	45.8	73.1	141.7	111.5	372.1
Native prairie with silver sage	0	0	0	38.2	38.2
Breaks	0	4.9	1.5	55.0	61.4
Total	45.8	78.0	143.2	204.7	471.7

Wildlife

Birds. Construction activities could affect avian species through mortality, habitat alteration or loss, and disturbance. The potential for mortality is associated with destruction of eggs or abandonment of active nests due to disturbance. Breeding bird surveys indicate that the wind farm area supports populations of grassland birds, including a number of BLM sensitive species. The ferruginous hawk, northern harrier, and sharp-tailed grouse are known to use ground nests in this area. Construction activities would occur during the nesting period for many bird species. Although construction activities would likely result in some level of egg loss and nest abandonment, the actual effects would be relatively small based upon the small area of disturbance (Table 3.7-7). Construction would be spatially and temporally distributed across the four wind farm development phases. The total area of temporary and permanent ground disturbance would range between 2 and 8 percent of each phase (Table 3.7-7), and construction of each phase would not last longer than one nesting season. Avian nest surveys would be conducted within all areas designated for temporary or permanent disturbance. Weekly nest surveys would be conducted during the appropriate nesting period for raptor, grouse, and grassland bird species. All active nests would be marked as avoidance areas. No construction activities would be permitted within 300 meters (1000 feet) of an occupied grouse or raptor nest until the young have fledged. Egg loss and nest abandonment would represent a low impact to avian species.

The wind farm would result in the permanent loss of approximately 101 acres of grassland habitat (Table 3.7-7), which represents a small proportion of the total wind farm area (0.5 percent) and the areas of individual phases (0.4 to 10 percent). The spacing of turbines could contribute to habitat fragmentation in the wind farm area. Project phasing would limit the spatial and temporal extent of construction-related disturbances during any given period. The loss of 101 acres of habitat would represent a small impact to grassland birds and raptors. Construction noise and associated human activity could temporarily disturb or displace individual birds, and potentially interfere with foraging, breeding, and nesting. Disturbance would be limited to the duration of construction activities. Construction-related disturbance, although limited to a single breeding/nesting season for each phase of the wind farm, would likely reduce survival and short-term reproductive success. Construction activities would result in a moderate impact to grassland birds and raptors.

The wind farm area represents high-quality habitat for sharp-tailed grouse. Several active leks are known to occur in the area (Figure 3.7-2), and the species undoubtedly nests within and adjacent to the wind farm. Construction effects would be similar to those previously described for avian species and could

include egg loss and nest abandonment, habitat loss, and disturbance and displacement effects. The potential for egg loss and nest abandonment would be minimized by pre-construction nest surveys within all areas designated for temporary or permanent disturbance. Nests would be marked as avoidance areas, and no construction activities would be permitted within 300 meters (1000 feet) of an occupied nest until the young have fledged. As previously described, a total of 101 acres of grassland habitat would be permanently lost as a result of the wind farm. Construction noise and associated human activity could temporarily disturb or displace individual birds, and potentially interfere with foraging, breeding, and nesting. Studies have suggested that noise from construction and human activities disturb gallinaceous species, displacing birds from traditional habitats, reducing use of leks, and causing nest abandonment (Young 2003). As each phase would not extend over more than a single breeding and nesting season, the period of disturbance would be limited. For each project phase, lek surveys would be conducted in the spring immediately prior to construction. In order to minimize potential effects upon sharp-tailed grouse (leks and breeding individuals), no construction activities would be permitted within 1 mile of an active lek between March 1 and May 1. Locations of individual turbines and turbine strings would be developed in consultation with the BLM and USFWS, and proximity to active leks would be evaluated with the agencies. Effects associated with construction of the wind farm would result in a moderate impact to sharp-tailed grouse in the project area.

Operation and maintenance of the proposed wind farm could affect avian species through direct mortality, disturbance and displacement, and habitat fragmentation. Bird fatalities resulting from collisions with turbines have been documented at most operational wind farms and have involved a variety of bird species, including passerines, raptors, waterfowl, and shorebirds (Erickson et al. 2002). Data indicate bird vulnerability to collisions with turbines is species-specific, habitat-specific, and facility-specific (Erickson et al. 2001), with morality rates being related to the number of turbines (EFSEC 2003). Other factors that influence avian mortality include the arrangement of turbines (i.e., end turbines have higher collision rates), proximity to migration corridors and rim edges, structure type (e.g., lattice structures provide perches within the Rotor Sweep Area [RSA]), tower height (i.e., blades closer to the ground on shorter turbines), conditions that reduce visibility (i.e., fog), and attractants such as abundant prey resources and certain FAA marker lights (Johnson et al. 2002; NWCC 2003).

U.S. wind facilities average 2.19 avian fatalities per turbine per year (Erickson et al. 2001). The average is reduced to 1.83 fatalities per turbine per year if the Altamont Pass wind farm is excluded from calculations. Passerines make up more than 80 percent of all bird fatalities at wind farms (Erickson et al. 2001), and mortality rates at wind farms have not created population-level effects for any species (Young and Erickson 2003). Average raptor mortality rates are 0.03 raptors per turbine per year overall, and 0.006 raptors per turbine per year excluding Altamont Pass (Erickson et al. 2001). The Foote Creek Rim wind farm in Wyoming is an area of high raptor use and has averaged 0.03 raptor casualties per turbine per year. Waterfowl and shorebird mortality at wind energy projects has been minimal, even at wind farms located immediately adjacent to prime waterfowl habitats (Erickson et al. 2002; Koford 2005).

Based upon these data, the wind farm at full build-out would result in an annual mortality of 402 to 600 passerines and 10 raptors (Table 3.7-8). However, this is likely an overestimate of realized mortality given local ecological conditions and the project design. Less than 5 percent of passerines were observed in the RSA during baseline avian surveys in the study area (WEST, Inc. 2005). The wind farm area does not contain any large, distinct ridgelines or rim edges that represent migratory pathways, and analysis of NEXRAD data failed to identify any large-scale avian migrations in this area. The turbine strings generally parallel the larger drainages, an orientation that minimizes collision risk by avoiding bird movement pathways into or through the drainages. The use of tubular structures and newer generation turbines would eliminate the creation of perching sites within the RSA and pose a lower risk of avian collisions, (Erickson et al. 2002). Raptor use of the VCWEP area is lower than observed at most existing and proposed wind projects (WEST, Inc. 2005), and raptor mortality has been absent to very low at most newer generation wind facilities (NWCC 2003). Potential for raptor mortality is further reduced by the

absence of concentrated prey sources (i.e., prairie dog towns) in the wind farm or adjacent areas. Spacing of the phases and individual turbine strings would provide space for foraging raptors without risk of intersecting the RSA. Turbines would not be located in proximity to any significant waterfowl habitat.

Table 3.7-8 Estimates of Annual Avian Mortality Resulting from Turbine Collisions

Phase	Number of Turbines	Passerines	Raptors
I	33	40-59	1
II	63	76-113	2
III	104	125-187	3
IV	134	161-241	4
Full Build-out	334	402-600	10

Source: Erickson et al. 2002; Young and Erickson 2003

Several measures would be implemented to further reduce avian mortality associated with turbine operations. If permitted by the FAA, white lights instead of red lights would be installed on turbines to reduce avian attraction (Ugoretz 2001). A post-construction monitoring program to assess avian mortality would be designed and implemented in coordination with the USFWS, BLM, and MFWP. Should monitoring identify individual turbines or turbine strings that cause disproportionately high mortality, turbine operation could be modified (i.e., seasonal shut downs) to reduce mortality. Mortality data would be incorporated into the design and layout of subsequent wind farm phases to reduce the mortality risk. Data obtained through baseline avian surveys and local ecological characteristics suggest that avian mortality rates are likely to be similar to or lower than those experienced at other wind farms. The project design and proposed mitigation measures would further reduce potential wind farm fatalities. Avian mortality would represent a moderate adverse impact, and would not likely have population-level consequences for any species (Young and Erickson 2003).

Noise and human activities associated with operation and maintenance of the wind farm would result in temporary disturbance of similar nature but reduced intensity compared to those discussed for project construction. General public access into the proposed wind farm area, which is currently provided by Kerr Road and Britsch Road, would change with the addition of a 2-mile primary access road. While these roads may experience increased traffic due to interest in seeing the operational turbines, all traffic would be restricted to the public roads. New roads would be constructed for access to the turbine strings. While these roads would be gated at certain times, the public could drive overland in these areas resulting in some level of disturbance. Temporary disturbance would represent a low impact for avian species utilizing habitats in proximity to roadways and turbines.

The presence of turbines and operation and maintenance activities could result in longer-term effects including avoidance and abandonment of habitats in proximity to the turbines as well as habitat fragmentation. Research has indicated that displacement effects associated with wind turbines are specific to the project location and individual bird species. Studies have identified reduced avian use in habitats within 50 to 100 meters of turbines (Johnson et al. 2000a). Displacement surveys at the Stateline wind facility indicated similar pre- and post-construction habitat use by grassland birds in the vicinity of turbines, and two grassland species actually increased use of habitats near turbines (WEST, Inc. 2004). Utilizing a worst-case scenario of total avian displacement from all habitats within 100 meters of turbines, the proposed wind farm at full build-out would result in the effective loss of approximately 2,592 acres of grassland habitat, or 13 percent of the total wind farm area (Table 3.7-9). The displacement area would also comprise a small proportion of individual phases (Table 3.7-9). While the effects of habitat displacement would be cumulative with direct habitat loss previously described, the total area would still represent a small proportion of the total wind farm and of individual phases.

Table 3.7-9 Area of Potential Displacement

Phase	Number of Turbines	Area of Displacement (in acres)	Proportion of Phase
I	33	256	23%
II	63	489	17%
III	104	807	15%
IV	134	1,040	10%
Full Build-out	334	2,592	13%

Displacement would likely result in reduced breeding success, productivity, and survival. Given the potential area of displacement, these effects could have population-level consequences for bird species (Johnson et al. 2000b). Baseline surveys have been initiated to assess pre-construction avian abundance and habitat use in the Phase I area as well as a reference area. A post-construction monitoring program would continue the baseline surveys to assess species-specific changes in abundance and habitat use to assess displacement effects associated with wind farm operations, and to improve the understanding of species-specific disturbance and displacement effects associated with wind developments.

Operation and maintenance activities and the presence of turbines could also fragment habitat for grassland species. The wind farm area encompasses the northwestern corner of a large native grassland ecosystem (Figure 3.7-1). This area is relatively intact, but has been somewhat fragmented by conversion to cropland, roads, and the Northern Border gas pipeline and compressor station. Human activity and turbine presence could effectively fragment habitats for avian species. The actual fragmentation effects are difficult to quantify, but would likely be species-specific and could include disruption of movement between seasonal habitats. In the worst case, these effects would lead to some reduction of breeding success, productivity, and survival. The location of the wind farm in the corner of this ecosystem (rather than the center) would help to reduce and isolate fragmentation effects to a portion of the area. The post-construction monitoring program would help to determine fragmentation effects. It is anticipated that displacement and fragmentation effects would represent a moderate to high impact on grassland species.

Potential operation and maintenance impacts for sharp-tailed grouse are similar to those described above. Collision-related mortality of sharp-tailed grouse has been relatively rare at wind farms (Erickson et al. 2002), precluding development of per turbine mortality estimates. Grouse fly at average heights of 14 to 23 meters (46 to 75 feet) above ground level (Royal BC Museum 2004), which places them under the RSA and limits potential risk for collision with turbines. While the potential for collision-related mortality of sharp-tailed grouse is low, post-construction monitoring of avian mortality would help to evaluate grouse fatalities and identify turbines and turbine strings causing disproportionate morality rates. The use of tubular turbine structures would avoid the creation of raptor perches that could result in increased predation upon sharp-tailed grouse. Mortality would represent a low impact to sharp-tailed grouse.

Noise and human activities associated with operation and maintenance activities would result in temporary disturbances similar to those previously discussed for project construction. Although no studies have been conducted to evaluate the effects of turbine presence on sharp-tailed grouse, there is anecdotal evidence that gallinaceous species, including sharp-tailed grouse, exhibit avoidance of tall structures (Braun 1998). Accordingly, the presence of turbines could displace sharp-tailed grouse from habitats in the vicinity of turbines. Turbines could also fragment sharp-tailed grouse habitat by disrupting movement corridors between seasonal habitats. While difficult to quantify, it is likely that the wind farm would result in the effective loss of sharp-tailed grouse habitat and could adversely affect individual reproduction and

survival. Pre- and post-construction avian surveys and lek monitoring would help to document habitat effects associated with the presence of turbines. The effects of displacement and habitat loss and fragmentation would be somewhat mitigated by phasing of the wind farm and the presence of extensive tracts of native grassland habitats in the immediate vicinity. Operation and maintenance activities would represent a moderate impact to sharp-tailed grouse in the project area.

Bats. Construction of the wind farm could affect bats through direct mortality, habitat loss and fragmentation, and disturbance effects. Bat surveys indicated limited use of the proposed wind farm area by bats, and there are no known roosts or hibernacula within or adjacent to the area. The potential for construction-related mortality is extremely low given their mobility and the absence of any roosts or hibernacula. Habitat loss and fragmentation effects are also expected to be minimal. The permanent loss of 101 acres of grassland foraging habitat would represent a small adverse effect given the large adjacent tracts of similar habitats. No shrub or forested riparian habitats or other areas of concentrated bat use would be affected. Construction would occur during daylight hours and would not result in any disturbance effects. Construction activities would result in a low impact to bats.

Operation and maintenance impacts include disturbance and displacement, habitat fragmentation, and mortality. As noted above, general disturbance and displacement effects would be minimal given the absence of hibernacula or roosts within or adjacent to the wind farm area. Maintenance activities would be conducted during daylight hours when bats are not present, and noise and movement associated with operating turbines are not likely to affect bats. Wind turbines could fragment foraging habitat; however fragmentation effects would be small given bats' mobility ability to forage in proximity to structures (i.e., trees, barns, houses), and use of echolocation.

Collision-related bat mortality has been documented at most wind farms in the western U.S. (Erickson et al. 2002). Annual bat mortality rates have ranged between 0.74 and 3.21 fatalities per turbine, with an overall average of 1.5 fatalities per turbine (WEST, Inc. 2004). Researchers have concluded that observed mortality rates do not have population-level effects, and no significant difference has been noted in mortality rates at lit and unlit turbines (Johnson et al. 2003). Most mortality has involved migrant or dispersing bats rather than residents (Johnson 2005; Johnson et al. 2003; Keeley 2001). Utilizing 1.5 fatalities per turbine per year, the proposed wind farm at full build-out would result in an annual mortality of 502 bats (Table 3.7-10). Actual mortality rates are expected to be somewhat lower due to the absence of any hibernacula or roosts, concentrated use areas, or movement/migratory corridors. Bats typically do not hunt higher than 25 meters (82 feet) above ground level, which places them under the RSA (Erickson et al. 2002). Post-construction monitoring would be implemented to assess bat mortality rates and identify turbines and turbine strings that cause disproportionate mortality rates. Monitoring data would be used by the BLM to modify turbine operation as necessary (i.e., seasonal shut downs) and incorporated into the design and layout of subsequent wind farm phases in an effort to reduce mortality. Despite these measures, bat mortality would likely occur and would represent a moderate impact in the project area.

Table 3.7-10 Estimated Annual Bat Mortality Resulting from Turbine Collisions

Phase	Number of Turbines	Annual Fatalities
I	33	50
II	63	95
III	104	156
IV	134	201
Full Build-out	334	501

Big Game. Construction activities could affect big game as a result of mortality, habitat loss, and disturbance effects. No road kill morality is anticipated as vehicle speeds would be relatively slow. The potential for direct mortality of mule deer and pronghorn as a result of construction activities would be

limited to newborn fawns. In order to minimize the potential for big game mortality, all construction areas would be surveyed for mule deer or pronghorn fawns immediately prior to any clearing or grading during the period of greatest susceptibility (May 15-June 30). As a result, no construction-related mortality of big game is anticipated.

Construction of the wind farm would result in the temporary disturbance of 472 acres and the permanent loss of 101 acres (0.5 percent of the wind farm), of grassland habitat (Table 3.7-7). The southern portion of the wind farm area encompasses approximately 8,521 acres of mule deer winter range (Table 3.7-11). Although turbine locations presented in 2.3-1 are preliminary, it is estimated that 115 turbines and associated access roads would be constructed within this winter range, resulting in the permanent disturbance of 34 acres (0.4 percent of the winter range within the wind farm area), a small proportion. Most of the disturbance (79 percent) would be associated with Phase IV of the wind farm (Figure 3.7-2). The loss of habitat would not be likely to influence survival rates or result in population-level effects.

Table 3.7-11 Estimated Disturbance of Mule Deer Winter Range in the Wind Farm

Phase	Area of Winter Range (acres)	Number of Turbines in Winter Range	Temporary Disturbance (acres)	Permanent Disturbance (acres)
I	464	9	13	1
II	685	15	19	4
III	1,439	7	10	2
IV	5,933	84	129	27
Total	8,521	115	171	34

Construction activities could temporarily displace individual mule deer or pronghorn from the project area, and interfere with foraging, breeding, and migration. Displaced individuals could likely utilize unoccupied adjacent habitats, if available. Construction of each individual wind farm phase would not extend over more than a single fawning season, thereby limiting the duration of any disruption of reproductive behaviors. In order to minimize the disturbance, all construction areas would be surveyed for mule deer and pronghorn fawns immediately prior to any clearing or grading during the period of greatest susceptibility (May 15-June 30). No construction activities would be permitted within 0.5 mile of any newborn fawn until the fawn has left the area. To minimize disturbance of mule deer on winter range, seasonal restrictions on construction activities in proximity to mule deer winter range would be implemented between November 15 and March 15. Disturbance and temporary displacement effects on big game would be mitigated by spatial and temporal phasing of the project, and seasonal restrictions on construction activities. Effects associated with construction of the proposed wind farm, including habitat loss and displacement, would have a low to moderate effect on big game species.

Effects on big game associated with operation and maintenance include disturbance and displacement, habitat fragmentation, and mortality. Human activity, vehicle traffic, and the presence of turbines represent long-term disturbance effects that could displace mule deer and pronghorn. Generally, maintenance activities and traffic would be of low volume and short duration and would result in temporary disturbance to individuals in the immediate vicinity of the activity or vehicle. These activities would not be likely to substantially interfere with foraging, breeding, or migration. Occasional maintenance activities may be required within mule deer winter range during winter months. In order to minimize disturbance of wintering animals, maintenance personnel would be required to notify the BLM

prior to conducting any activities within winter range between November 15 and March 15. Contractors and maintenance personnel would also be instructed to avoid disturbing and harassing wintering animals.

The creation of access roads within the wind farm area could result in increased disturbance and mortality of big game. Kerr Road and Britsch Road currently provide access into the area, and these existing roadways would be utilized by the public to access the wind farm. While these roads may experience increased public traffic associated with the desire to see the operational turbines, there would be no increased accessibility into the general wind farm area as a result of the project. New access roads would be constructed along individual turbine strings; however, there are existing roads throughout the wind farm area, and the flat grassland plateaus in the area facilitate off-road travel that currently occurs by landowners, lessees, hunters, and the general public. Thus, the creation of new access roads may attract additional vehicle traffic but would not result in a substantial increase in disturbance relative to current conditions. With the exception of Phase IV, the wind farm generally encompasses a small amount of mule deer winter range and few turbine access roads would be constructed in this area. The wind farm area is generally inaccessible by passenger vehicle during winter months due to snow conditions, and the creation of roads would not result in a significant increase in winter traffic. The proposed wind farm would not affect accessibility by snowmobile relative to current conditions.

The potential exists for increased levels of harvest-related mortality as a result of greater accessibility into remote habitats via wind farm access roads. However, increases in legal and illegal harvest mortality are expected to be relatively small for several reasons. First, there are existing roadways that provide access into and throughout the wind farm area, and the flat open grassland plateaus facilitate off-road travel. New roads constructed for access to the turbine strings would not significantly increase the ability of the public to access currently inaccessible portions of the study area. Second, most roads within the study area would not be maintained during winter months, and would generally be impassable by vehicles after snow events. Third, while snowmobiles could provide access within the wind farm area, the creation of new access roads would not affect accessibility via snowmobile. Finally, much of the land within and adjacent to the wind farm is privately owned and hunters would have to obtain permission to hunt on these lands.

The presence of turbines could result in habitat abandonment, displacement of individual animals, and habitat fragmentation. There is little information on displacement and fragmentation effects of wind projects upon big game. Studies at the Foote Creek Rim project in Wyoming identified no change in pronghorn habitat use in the vicinity of turbines (Johnson et al. 2000a). Mule deer also continued to use habitats in the vicinity of turbines at Foote Creek Rim, although limited sample sizes precluded statistical analysis. Recent studies by Sawyer et al. (2005) have demonstrated substantial mule deer avoidance of gas wells in Wyoming. If big game species were to exhibit similar avoidance and/or decreased use of habitats in proximity to turbines, the project could result in indirect habitat losses that are substantially larger than the area of ground disturbance. These losses could fragment habitat and reduce carrying capacity of big game winter range within the wind farm area and result in population effects (i.e. reduced survival). Similarly, avoidance of turbines could result in distributional shifts which would increase densities in the remaining portions of the winter range and expose the population to greater risk of adverse density-dependent effects.

MFWP has multiple years of baseline data on mule deer and pronghorn population sizes and habitat use for a large area that includes the wind farm. Additionally, big game winter surveys were completed as part of the VCWEP baseline wildlife studies. The post-construction wildlife monitoring program would include a big game component that would facilitate evaluation of the displacement impacts of a wind energy project on mule deer and pronghorn and improve our understanding of the effects of wind farms and turbines on these species. Operation and maintenance of the wind farm has the potential for a moderate impact to big game species.

Special Status Species

Pallid Sturgeon (Federal Endangered). The pallid sturgeon does not occur in the wind farm area and no suitable habitat occurs in this area. No identifiable impact to the pallid sturgeon would result from the proposed wind farm.

Piping Plover (Federal Threatened). The piping plover does not occur in the wind farm area and no suitable habitat occurs in this area. No identifiable impact to the piping plover would result from the proposed wind farm.

Black-Footed Ferret (Federal Endangered). The black-footed ferret does not occur in the wind farm area and no suitable habitat occurs in this area. No identifiable impact to the black-footed ferret would result from the proposed wind farm.

Interior Least Tern (Federal Endangered). The interior least tern does not occur in the wind farm area and no potential suitable habitat occurs in this area. No identifiable impact to the interior least tern would result from the proposed wind farm.

Whooping Crane (Federal Endangered. Suitable habitat for the whooping crane is limited in the wind farm area, which is located at the edge of the species' migratory corridor. Given previous sightings in the region, there is a small potential for whooping cranes to occasionally fly over the project area during seasonal migrations, where operating turbines could pose a threat. However, whooping cranes typically fly at high altitudes during migrations (1,000-5,000 feet above the ground) and migrating whooping cranes are unlikely to collide with wind turbines. No whooping crane mortalities have been documented at wind farms (USDI 2005). However, whooping cranes may fly at lower altitudes that place them at risk of collision during take-off/landing or during inclement weather. Given that the wind farm is located at the edge of the migratory corridor and supports little suitable habitat, the proposed wind farm would have no identifiable impact to the whooping crane.

Bald Eagle (Federal Threatened). The bald eagle occurs on big game winter range in the project area during winter months. The proposed wind farm could affect the bald eagle as a result of temporary disturbance or displacement associated with construction and maintenance activities, loss of foraging habitat, and mortality of individuals via collision with turbines. Traffic, noise, and human presence during construction and maintenance of the wind farm could displace individual bald eagles foraging in the vicinity. The wind farm area contains a limited amount of potential foraging habitat, and construction and maintenance activities would have little potential to affect bald eagles. Several mitigation measures would be implemented as part of the project in order to minimize potential disturbance and displacement effects. Construction and maintenance activities would be prohibited within big game winter range between November 15 and March 15 as recommended in the Pacific Bald Eagle Recovery Plan (USFWS 1986). Any emergency maintenance activities in big game winter range during this period would be approved in advance by the BLM Authorized Officer. A biologist would monitor construction activities on a daily basis when such activities occur within 0.5 mile of big game winter range during the November 15 - March 15 period. Construction activities would be modified or curtailed when bald eagles are present to reduce disturbance. Finally, construction crews would be instructed to avoid disturbing or harassing wildlife (including bald eagles) and to report any bald eagle sightings to the biological monitor or BLM Authorized Officer.

Construction of new roads associated with the proposed wind farm could increase public access and associated disturbance and displacement effects. Impacts associated with increased accessibility would be ameliorated by two factors. First, there are existing roadways in the general project area. These roads currently provide access throughout the area, and new access roads associated with the proposed project would not significantly increase public access into currently inaccessible portions of the study area. Second, most roads in the study area are not improved or maintained during winter months, and therefore are generally impassable in the winter. Accordingly, there would be little or no public access during the period that bald eagles are most likely to occur in the project area. While snowmobile activity may occur in the project area and disturb bald eagles during winter months, the creation of new access roads would not influence snowmobile use within the project area.

The wind farm would result in the permanent loss of approximately 34 acres of big game winter range (bald eagle foraging habitat). This limited loss of winter range is not expected to affect survivorship of mule deer or pronghorn, and therefore would not affect the bald eagle. The proposed wind farm is not likely to result in bald eagle mortality. Raptor mortality has been relatively low at wind farms and there have been no reported bald eagle fatalities at any wind facilities in the western U.S. (Erickson et al. 2002, Johnson et al. 2000a; Young et al. 2003). The potential for bald eagle mortality would be further minimized by the project location approximately 25 miles north of roosting habitat along the Milk River and generally north of foraging habitat on big game winter range. There are no concentrated prey sources (i.e., prairie dog towns) that would attract bald eagles into the area, and it is not situated along a migratory route or between roosting and foraging habitats. The collector system would be underground, thereby eliminating the risk of collision and electrocution. The proposed wind farm location and design would minimize adverse effects upon the bald eagle. The implementation of specific mitigation measures, including seasonal restrictions, would reduce the potential for disturbance. Construction, operation, and maintenance of the wind farm would have a low impact on the bald eagle.

Fish (BLM Sensitive). No habitat for any BLM sensitive fish species occurs in the wind farm area, and no identifiable impact would result from the proposed wind farm.

Reptiles and Amphibians (BLM Sensitive). Potential adverse impacts to reptile and amphibian species include habitat loss associated with construction of the wind farm phases (Table 3.7-7), displacement, and mortality. As turbine and road construction on the wind farm would be limited to upland habitats, species with the greatest potential to be adversely affected include the plains spadefoot, greater short-horned lizard, and the western hognose snake. The limited amount of permanent habitat loss (101 acres) would represent a small adverse effect given the availability of similar habitat in the area. Displacement could result in reduced survival for individuals. Clearing and grading could result in mortality of individuals inhabiting underground burrows within construction zones. The hognose snake, the greater short-horned lizard, and plains spadefoot would be susceptible to construction-related mortality. As a result of limited disturbance and spatial and temporal phasing of the wind farm, it is anticipated that the project would have a low impact upon sensitive reptiles and amphibians and would not result in any population-level effects.

Swift Fox (BLM Sensitive). The swift fox is known to occur in the wind farm area, and suitable habitat occurs in all four phases. Potential adverse impacts associated with wind farm construction include habitat loss, displacement, and mortality. The habitat loss effects would be directly proportional to the ground disturbance associated with each phase (Table 3.7-7), and would represent a small proportion of the wind farm area.

No studies have evaluated the effects of wind farms on swift fox, and it is difficult to predict the disturbance and displacement effects. While construction activities would temporarily disturb swift fox in the vicinity, it is unlikely that operation and maintenance activities would be of the intensity and frequency to create adverse effects.

Swift fox mortality is associated with burial of adults and young in dens. Pre-construction den surveys would be conducted within all work areas, and all den locations would be marked as avoidance areas to prevent accidental mortality. The primary cause of natural mortality of swift fox is predation by coyotes (Cotterill 1997), and it is not known whether the wind farm would affect coyote densities in the project area. The wind farm would likely result in a low impact on the swift fox.

Bats (BLM Sensitive). Based upon habitat requirements and known distribution, the long-eared myotis and Townsend's big-eared bat both have a relatively low probability of occurrence in the wind farm area. Neither species was detected during ANABAT and mist net surveys conducted in the wind farm area; however the occurrence of these species cannot be precluded given the limited duration of these surveys. Adverse impacts associated with the wind farm would include habitat loss and mortality. The loss of 101 acres of grassland habitat would represent a small adverse effect. No shrub or forested riparian habitats would be disturbed. Human activities would be conducted during daylight hours when bats are not present. While bat mortality has been documented at most wind farms, these two species are rarely killed (Erickson et al. 2002). A post-construction monitoring program to assess bat mortality would be designed and implemented in coordination with wildlife biologists from the BLM, MFWP, and USFWS. Turbine operation could be modified (i.e., seasonal shut downs) based upon the result of this monitoring to reduce bat mortality. The wind farm would likely result in a low impact on the long-eared myotis and Townsend's big-eared bat.

Grassland Bird Species (BLM Sensitive). A total of 11 BLM sensitive grassland birds species are known to occur in the wind farm area (Table 3.7-4). The wind farm would affect avian species through mortality, habitat loss and fragmentation, and displacement effects similar to those previously described for avian species. These effects are expected to be relatively proportional to the number of turbines and the area of disturbance associated with each phase of the wind farm. Mortality could result from destruction of eggs, abandonment of active nests, and collisions with turbines. Nest losses are expected to be relatively low based upon the small proportion of the wind farm area disturbed (Table 3.7-7), wind farm phasing, the fact that construction of each phase would not last longer than one nesting season, and the completion of pre-construction nest surveys to help prevent accidental nest destruction.

Given the abundance of BLM sensitive species, some level of collision-related mortality is anticipated. Fatality rates would be correlated with species flight characteristics and the number of turbines in each phase. Less than 5 percent of passerines observed in the study area during baseline avian surveys were flying within the RSA (WEST, Inc. 2005). A relative collision exposure index based upon avian surveys indicated a relatively low risk of collision for grassland species (WEST, Inc. 2005). The only exception was the Sprague's pipit, which had a relatively high index due to the large population and flight characteristics. There is little in literature regarding susceptibility of this species to collisions with turbines. However, the high exposure index suggests that collision-related mortality of Sprague's pipit would result from operation of the wind farm. If the species is susceptible to collisions, the proposed project could create population-level effects upon the Sprague's pipit in the project area. Given the abundance of grassland habitats in the wind farm area, it would not be possible to locate turbines outside the Sprague's pipit habitat. Post-construction monitoring on Phase I would provide data on Sprague's pipit mortality and facilitate assessment of population-level effects. If monitoring indicates that individual turbines/turbine strings are causing disproportionate mortality, the operation of these turbines/turbine strings would be modified (i.e. seasonal shut-downs) in consultation with BLM and USFWS. These data would also be incorporated into BLM analysis and approval of subsequent phases of the wind farm. The proposed wind farm could have a moderate to high affect upon Sprague's pipit in the project area. As previously noted, the orientation of the turbine strings parallel to drainages and the use of tubular structures would help to reduce mortality. Painting rotor blades and use of white FAA lights on turbines could also help to reduce "attraction" of birds. Post-construction mortality monitoring program would be implemented to assess avian mortality. Should monitoring identify individual turbines or turbine strings that cause disproportionately high mortality, turbine operation could be modified (i.e., seasonal shut

downs) in an effort to reduce mortality. Additionally, this information would be incorporated into the design and layout of subsequent wind farm phases to reduce the risk of collision-related mortality. Collision-related mortality is expected to represent a moderate impact, and would not by itself result in regional population-level effects for any individual species.

Maintenance activities and the presence of turbines could result in habitat abandonment and fragmentation. Displacement from all habitats within 100 meters of the turbines would result in the effective loss of 2,592 acres of grassland habitat (13 percent of the total wind farm area [Table 3.7-9]). The actual fragmentation effects would likely be species-specific, and are difficult to quantify. The wind farm and adjacent lands to the east and south represent an extensive area of high quality native grassland habitats into which displaced individuals could move. However, these adjacent habitats support existing bird populations and there may be little unoccupied habitat to support individuals displaced by the turbines. The displacement associated with each phase would be a small proportion of the total area, but would likely result in some reduction in breeding success, productivity, and survival. The location of the wind farm in the corner of this ecosystem (rather than the center) would help to reduce fragmentation effects.

A post-construction monitoring program would be conducted to assess species-specific changes in abundance and habitat use resulting from the wind farm. This program would provide information on disturbance/displacement effects associated with each phase and improve the understanding of species-specific disturbance and displacement effects associated with wind developments. Displacement and habitat fragmentation associated with the wind farm could result in a moderate impact to BLM sensitive grassland bird species.

Raptors (BLM Sensitive). Potential adverse impacts to the golden eagle, ferruginous hawk, and Swainson's hawk would be similar to those previously described for raptors, including habitat loss, disturbance, displacement, and mortality. Construction activities would result in the loss of a small amount of potential foraging habitat and the temporary displacement of individuals from portions of the wind farm area. Habitat loss and disturbance would be mitigated by the presence of adjacent native grassland habitats and the temporal and spatial phasing of the wind farm. The presence of turbines could also displace individual raptors from the wind farm, although research has shown continued post-construction use of wind farm habitats by raptors (WEST, Inc. 2004).

Mortality of sensitive raptor species may result from the destruction or abandonment of nests during construction and from collisions with turbines during operation. Pre-construction raptor nest surveys would be conducted in the wind farm and adjacent areas to identify active nests and avoid destruction of ground nests. Construction activities within 300 meters (1000 feet) of active nests would be restricted until the young have fledged to minimize potential adverse impacts to nesting raptors and their young. Construction phasing would limit the duration of disturbance to a single nesting season. The potential for collisions with turbines is somewhat reduced by the absence of concentrated prey sources in the wind farm area and the fact that the area receives low raptor use compared with other wind farms (WEST, Inc. 2005). Raptor casualties have generally been low even where high use has been observed, including use by golden eagles (Young et al. 2003). A post-construction mortality monitoring program would be implemented to assess raptor mortality. Should monitoring identify individual turbines or turbine strings that cause disproportionately high mortality, turbine operation could be modified (i.e., seasonal shut downs) in an effort to reduce mortality. Additionally, this information would be incorporated into the design and layout of subsequent wind farm phases to reduce the risk of collision-related mortality. The wind farm would result in a low adverse effect to BLM sensitive raptors.

Greater Sage-Grouse (BLM Sensitive). Suitable habitat for greater sage-grouse is limited in the wind farm area. Only three individuals were observed during avian surveys indicating a low abundance in the proposed wind farm area. No greater sage-grouse leks occur within the area, and only one lek was located

within 5 miles of the wind farm. Potential habitat is limited to silver sage communities located along the drainages in the extreme southern portion of the wind farm. As the wind farm would result in a small loss of silver sagebrush habitat, the proposed project would result in a low impact on the greater sage-grouse.

Transmission Route C

Vegetation

Construction, operation, and maintenance of the transmission line could adversely affect vegetation as a result of clearing and grading of vegetated areas in preparation of transmission line construction; clearing and grading of access roads; construction of transmission line structures; and refueling of construction equipment. Vegetation could be adversely affected by injury or mortality, generation of fugitive dust, exposure to contaminants, introduction of noxious weeds and invasive species, increased public access, and fire (Table 3.7-6).

Clearing, grading, and construction activities would result in the direct injury to or loss of vegetation, thereby altering the plant communities in the disturbed areas of Route C. Impacts to vegetation in staging areas for construction equipment, structure work areas, reel and pole storage yards, laydown areas, and pulling and tensioning sites would be temporarily disturbed. Construction would result in the permanent loss of native vegetation on 70.2 acres (Table 3.7-12). Permanent impacts to vegetation would occur at access road locations from grading, trampling, crushing, or removal of vegetation. Vegetation in the direct construction footprint of transmission line structures would be permanently removed. The impacts to vegetation would be alleviated by leaving vegetation in place wherever possible and reseeding disturbed areas with native grasses, forbs, and shrubs. Access road locations would be reseeded following construction, but the road prisms would be preserved to allow for routine patrols and maintenance.

Table 3.7-12 Native Vegetation Disturbance Associated with Transmission Routes A and C (acres)

Vegetation Community	Route A		Route C	
	Permanent	Temporary	Permanent	Temporary
Native mixed-grass prairie	86.6	44.1	47.3	36.4
Native prairie with silver sage	16.7	11.0	14.3	14.2
Silver sage	2.9	1.3	2.9	1.3
Upland shrub	1.7	0.6	1.7	0.6
Riparian with silver sage	0.6	0.4	1.0	0.8
Riparian willow	0.9	0.4	0.9	0.4
Riparian forest	2.1	1.5	2.1	1.2
Total	111.5	59.3	70.2	54.9

The use of heavy equipment on areas of temporary disturbance could cause soil compaction that may affect plant survival and growth after construction completion. Soil compaction might directly affect soil characteristics suitable for native growth and might reduce the infiltration of water and nutrients into the soil. Compacted soils may also be susceptible to colonization by invasive species if measures are not taken to reduce the establishment of these species. Construction traffic and clearing associated with new roads often provide routes for migration of weeds into previously weed-free areas. The severity of weed advancement would depend on a variety of factors, including the health and vigor of the existing vegetation; the timing and duration of clearing reseeding and replanting of cleared areas; and the weed species present in the vicinity. Implementing of proposed measures to control the introduction and spread of undesirable plants during construction and operations would minimize potential adverse effects associated with invasive species.

Fugitive dust generated during clearing, grading, and travel on roadways may impact vegetation. This potential impact would be greatest during construction; however, fugitive dust generation during construction would be short-term and localized to the immediate area of the transmission line. Potential impacts to onsite vegetation would be negligible through the implementation of appropriate dust control measures to minimize fugitive dust emissions from construction-related traffic and additional wind-blown dust as a result of ground disturbance (see Section 3.15 and Appendix A).

During construction, operation, and maintenance, vegetation communities may be subject to exposure to contaminants. Construction equipment would need to be refueled and small quantities of hazardous materials (such as waste paints and degreasing agents) may be generated. Accidental fuel spills (e.g., gasoline, diesel), pesticides, or releases of hazardous materials could result in the exposure of vegetation at the project site. Reestablishment of the vegetation may be impacted or delayed because of residual soil contamination. Because of the relatively small amount of fuel and pesticides expected to be used, accidental releases would be small and would affect vegetation primarily at the release site (see Section 3.13).

Construction, operation, and maintenance could introduce noxious weeds and invasive species to the area that, in turn, could alter the vigor and coposition of existing vegetation communities. Traffic and clearing associated with new roads often provides routes for the migration of noxious weeds and invasive species into areas that were previously devoid of noxious/invasive vegetation. Seeds may become stuck in tire treads, and soil or mud on vehicles or other equipment and be transported to new, suitable habitats. The severity of noxious/invasive species advancement would depend upon a variety of factors, including the health and vigor of the existing vegetation; the timing and duration of clearing, reseeding, and replanting of cleared areas; and the noxious/invasive species present in the vicinity. However, the establishment of noxious/invasive vegetation may be limited by early detection and subsequent eradication of the plants. A pre-construction survey would be conducted to identify and map the locations of noxious weeds and invasive plants as part of the Noxious Weed and Invasive Plant Control Plan (Appendix C). Specific measures identified in this plan include: cleaning construction vehicles; reseeding disturbed areas with a certified weed-free mixture of native grasses, forbs, and shrubs; using certified weed-free mulch; and annual post-construction monitoring and treatment of access roads and construction sites for a minimum of five years following construction. Currently, no noxious weeds are known to occur in the vicinity of the route but surveys have not been conducted.

The construction of new roads may increase access to adjacent lands that previously had limited access. Impacts to vegetation could occur from increased use, unauthorized OHV use and illegal dumping. Human activities, especially from OHV use and hiking into previously less accessible areas, may act to disperse seeds of invasive vegetation. Visitors may carry seeds on their clothing and equipment and motorized vehicles may carry seeds on tires and in vehicle mud. Increased human activity also increases the potential for fires. Wildland fires could be ignited by hot engine parts in contact with dry vegetation during OHV use and by careless cigarette use. The potential for wildland fires would be expected to be greatest in summer and autumn, when native grasses have died back and fuel loads are at their greatest. To limit new or improved access into the area, all new access roads would be reseeded.

Transmission line construction, operation, and maintenance activities have the potential to ignite wildfires if precautions are not taken. Prior to construction, a comprehensive fire control plan would be developed to take into consideration the semi-arid climate and would address seasonal fire risks. Implementation of mitigation measures would protect vegetation during the construction, operations and maintenance of the transmission line.

Construction would result in permanent loss of riparian vegetation on approximately 4.0 acres. In addition to mitigation measures mentioned above, transmission line structures in riparian areas would be placed to avoid sensitive features or to allow conductors to clearly span the features, within the limits of tower

design. If sensitive features cannot be avoided, structures would be placed so as to minimize the disturbance.

No Federally-listed endangered or threatened plant species are known to occur along Route C; however, surveys have not been conducted. Impacts to rare, sensitive, and unique plants and communities would be alleviated or avoided by leaving vegetation in place wherever possible and reseeding disturbed areas with native species. In addition, pre-construction pedestrian surveys for rare and sensitive plant species would be conducted within all areas to be temporarily or permanently disturbed. Agencies would be notified of survey locations and any positive findings for sensitive plant species. If rare or sensitive plants are found within the project, all supervisory construction personnel would be instructed on the protection of rare or sensitive plants, and the boundaries of rare and sensitive plant populations would be clearly delineated with flagging or fencing.

Wildlife

Birds

The effects upon wildlife associated with the construction, operation, and maintenance of the proposed transmission line would include mortality, temporary disturbance, and habitat loss and fragmentation. A number of activities could result in mortality. The northern portion of Route C traverses high quality grasslands that could be utilized by nesting sharp-tailed grouse and raptors. Site preparation and road construction could destroy bird and raptor nests. However, the relatively small area of disturbance, the limited duration of construction (one nesting season) and the completion of pre-construction nest surveys and avoidance of occupied grouse or raptor nests (Appendix A) would reduce potential effects.

The transmission line is not likely to result in avian mortality as a result of electrocutions. Avian species with long wing spans are susceptible to electrocution, although electrocutions are rare on transmission lines with a voltage greater than 69kV since conductor spacing precludes simultaneous contact with two conductors (Avian Power Line Interaction Committee [APLIC] 1996). The transmission line design would incorporate a raptor-safe configuration and meet all APLIC standards (APLIC 1996). The transmission line design would eliminate the avian electrocution hazard for raptors. The potential for mortality of any given species is likely correlated with bird densities and the length of transmission line traversing the species' habitat. While raptor mortality as a result of transmission line strikes is rare (Faanes 1987; APLIC 1994), grouse and waterfowl mortality as a result of collisions with transmission lines has been observed. In areas of high bird use, markers (i.e., balls) would be used to increase visibility of conductors and smaller diameter ground wires. Transmission line structures can be utilized as perches by raptors and ravens, resulting in increased predation rates upon birds.

Noise and increased human activity may result in the temporary displacement of individual birds during construction and maintenance activities. Disturbances effects are similar to those described for the wind farm, and could interfere with foraging, breeding, and nesting activities. Construction would proceed fairly rapidly, and would be of limited duration in any specific area. Construction-related disturbance would not extend beyond a single breeding/nesting season. Maintenance activities would consist of occasional inspections, and would not cause substantial disturbance.

Transmission Route C could result in the permanent loss of up to 70.2 acres of native habitat (Table 3.7-12), and would likely displace a small number of individual birds. While displaced individuals could move into adjacent habitats, these habitats may be occupied, resulting in some level of reduced breeding success, productivity, and survival. Given the relatively small area of disturbance, displacement effects are not likely to have population-level consequences for any species. There is anecdotal evidence that some avian species may respond negatively to the presence of new structures (Braun 1998). The proposed transmission line could result in behavioral disturbance and effectively fragment habitat for species that are sensitive to vertical structures. The actual fragmentation effects are likely species-specific and

difficult to quantify, but could include disruption of movements between seasonal habitats and reduced breeding success, productivity, and survival.

The northern portion of the Transmission Route C traverses high quality sharp-tailed grouse habitat. Route C would traverse a total of 3.3 linear miles within 2 miles of an active sharp-tailed grouse lek (Table 3.7-5). Three active leks are located within 2 miles of this alternative, and the nearest lek is approximately 1 mile away. Site preparation and road construction could destroy grouse nests; however, the relatively small area of disturbance and the completion of pre-construction nest surveys and avoidance of occupied grouse nests (Appendix A) would reduce the potential for egg destruction and nest abandonment. In order to minimize potential disturbance effects, no construction activities would be permitted within 1 mile of an active lek between March 1 and May 1.

Transmission line structures can be utilized as perches by raptors and ravens, resulting in increased predation upon sharp-tailed grouse (Connelly et al. 2004). In order to minimize potential for increased predation on sharp-tailed grouse, perch prevention devices would be installed on any transmission line structure located within 1 mile of an active grouse lek. Mortality of grouse from collisions with transmission lines is known to occur, and would likely be correlated with the length of transmission line traversing grouse habitat and the density of grouse in that habitat. While it is not possible to quantify potential mortality, the distance of Route C from active leks would likely reduce the potential for collision-related mortality of sharp-tailed grouse. Post-construction mortality surveys would be conducted along the line to evaluate grouse mortality.

There is anecdotal evidence that grouse may respond negatively to the presence of transmission line structures (Braun 1998; Connelly et al. 2004). The proposed transmission line could result in behavioral disturbance and effective fragmentation for sharp-tailed grouse. The actual fragmentation effects are difficult to quantify, but could include disruption of movements between seasonal habitats (i.e., leks, nesting habitat, winter range). In the worst case, these effects would result in some reduction of breeding success, productivity, and survival. The distance of Transmission Route C from active grouse leks would somewhat reduce displacement and fragmentation effects. The transmission line would result in a small to moderate impact to sharp-tailed grouse.

Big Game

Construction and maintenance activities could temporarily displace individual mule deer or pronghorn in the project area. These activities could interfere with foraging, breeding, and migration activities depending on the timing and season during which construction occurs. Transmission Route C would traverse approximately 5.6 linear miles of mule deer winter range (Table 3.7-5). This line would result in the loss of up to 22.7 acres of mule deer winter range, which represent a small fraction of total available winter range in the area. To minimize potential disturbance of mule deer on winter range, restrictions on construction activities in proximity to mule deer range would be developed by MFWP and BLM.

Occasional maintenance activities may be required within mule deer winter range during winter months. This disturbance would be temporary. Maintenance personnel would be required to notify the BLM prior to conducting any activities within winter range during winter months. The period would be defined in the Plan of Development (POD). Access roads could result in increased legal and illegal harvest of mule deer. However, increased harvest rates would be relatively small because there is existing access along Route C via Cornwell Road, transmission line roads would not be maintained during winter months and would be impassable after snow events, and hunters would have to obtain permission to hunt on private land.

Special Status Species

Pallid Sturgeon (Federal Endangered). The species does not occur in area. No identifiable impacts to the pallid sturgeon would result from Transmission Route C.

Piping Plover (Federal Threatened). The species does not occur in area. No identifiable impacts to the piping plover would result from the proposed transmission line.

Black-Footed Ferret (Federal Endangered.) The species does not occur in area. No identifiable impacts to the black-footed ferret would result from the proposed transmission line.

Interior Least Tern (Federal Endangered). The species does not occur in area. No identifiable impacts to the interior least tern would result from the proposed transmission line.

Whooping Crane (Federal Endangered). Transmission lines have been responsible for mortality of whooping cranes (Canadian Wildlife Service and USFWS 2005). Although suitable habitat for the whooping crane is limited along Transmission Route C and the area is located at the edge of the species' migratory corridor, previous sightings in the region suggest there is a small potential for the species to fly over the project area during seasonal migrations. Although migrating whooping cranes typically fly at high altitudes (1,000-5,000 feet above the ground) during migration, there is a remote possibility that the species could collide with the transmission line during take-off/landing or during inclement weather. Transmission Route C would result in no identifiable impact to the whooping crane.

Bald Eagle (Federal Threatened). Transmission Route C could affect the bald eagle through temporary disturbance or displacement associated with construction and maintenance activities, loss of roosting and foraging habitat, and mortality of individuals from collisions. Construction and maintenance activities could displace bald eagles roosting along the Milk River or foraging on big game winter range. Several mitigation measures would be implemented to minimize potential disturbance and displacement effects. First construction and maintenance activities not associated with emergency repairs would be prohibited within 1 mile of big game winter range and cottonwood riparian habitats between November 15 and March 15, as recommended by the Pacific Bald Eagle Recovery Plan (USFWS 1986). Second, any emergency maintenance activities that are necessary in these sensitive areas during this period would be approved in advance by the BLM Authorized Officer. Third, a biologist would be on site to monitor construction activities on a daily basis when such activities occur within 1 mile of big game winter range or cottonwood riparian habitat between November 15 and March 15. Construction activities would be modified or curtailed when bald eagles are present. Fourth, construction crews would be instructed to avoid disturbing or harassing wildlife (including bald eagles) and to report any bald eagle sightings to the biologist monitor and BLM Authorized Officer.

Route C would cause a small reduction in bald eagle foraging and roosting habitat. The loss of up to 22.7 acres of mule deer winter range would not adversely affect either mule deer survivorship or the amount of carrion available for bald eagles. Construction of the proposed transmission line would require removal of several mature cottonwood trees at the Milk River crossing, which would represent the loss of potential bald eagle roosting habitat. Given the extensive cottonwood gallery forest that exists along this portion of the Milk River, the removal of several trees would represent a small adverse impact. Several measures would be implemented to reduce the potential effects of this habitat loss, including locating the crossing where the cottonwood forest is relatively narrow and utilizing a single pole design at the crossing to minimize the number of trees removed.

As previously noted, Transmission Route C could result in direct mortality of raptors, including bald eagles, as a result of collisions. Electrocution potential would be eliminated by implementing a raptor-safe transmission line design that includes 60 inches of horizontal separation and 48 inches of vertical separation in accordance with APLIC standards (APLIC and USFWS 2005). Transmission line strikes are generally not considered to be an important cause of bald eagle mortality (Faanes 1987; APLIC 1994). The greatest potential for transmission line strikes occurs where a line crosses a major water body (Faanes 1987). In order to minimize the potential for wire strikes, conductors would be marked along the Milk River span. Transmission Route C could result in some minor disturbance/displacement effects to the bald

eagle, but is not expected to result in mortality or reduced survival. The project would result in a low impact to the bald eagle.

Fish (BLM Sensitive). The blue sucker and sauger likely inhabit the Milk River in the vicinity of the proposed transmission line crossing for Route C. Erosion control measures (Appendix A) would be implemented during construction to minimize the potential for sedimentation and associated adverse effects to the Milk River. Transmission Route C would have no identifiable impact on the blue sucker and sauger.

Reptiles and Amphibians (BLM Sensitive). Potential adverse impacts to reptile and amphibian species include habitat loss, disturbance and displacement, and mortality. The permanent loss of up to 70.2 acres of habitat and displacement effects could result in reduced survival for individuals. Clearing and grading could result in mortality of individuals inhabiting underground burrows within construction zones. It is anticipated that habitat loss, displacement, and mortality would result in a low impact upon sensitive reptile and amphibian species.

Mammals (BLM Sensitive). Potential adverse impacts to swift fox include habitat loss, displacement, and mortality. While the wind farm area represents the primary swift fox habitat in the study area, construction of the transmission line along Route C may result in the loss of approximately 66 acres of grassland habitat. Swift fox in the wind farm area were relatively tolerant of low-level human activity during avian surveys. While human activity during construction would likely disturb and displace individual swift fox in the vicinity, it is unlikely that the transmission line would result in habitat abandonment. The potential for mortality associated with burial of adults and young in dens would be minimized by conducting pre-construction den surveys within work areas and marking all den locations as avoidance areas.

The long-eared myotis and Townsend's big-eared bat have a low probability of occurrence in the project area, and no known roosts or hibernacula occur within or adjacent to this area. However, Route C would result in the permanent loss of approximately 3 acres of forested riparian habitat which is utilized by both species. Given the flying ability of bat species and their use of sonar to navigate through the environment, the potential for collisions with transmission lines or structures is extremely low. Route C would result in a low impact to sensitive mammals.

Birds (BLM Sensitive). The primary effects upon BLM sensitive bird species are the same as those previously described for birds at the wind farm, and include mortality, temporary disturbance, and habitat loss and fragmentation. Based upon the length and habitats traversed by Route C, it is expected to have a moderate impact on these species.

Raptors (BLM Sensitive). Potential adverse impacts to the golden eagle, ferruginous hawk, and Swainson's hawk would be similar to those previously described for raptors and the bald eagle, and include habitat loss, disturbance and displacement, and mortality. The loss of up to 70.2 acres of habitat, temporary disturbance effects, and limited potential for collision and electrocution mortality due to the raptor-safe design (APLIC 1996) would represent a low potential adverse impact to these species. Pre-construction surveys would be conducted to locate and prevent the accidental destruction or disturbance of raptor nests. The proposed transmission line is expected to have a low impact on these species.

Greater Sage-Grouse (BLM Sensitive). Potential effects upon the greater sage-grouse include disturbance, habitat loss and fragmentation, and mortality. Individual sage-grouse disturbed or displaced by the transmission line would be able to utilize adjacent habitat. Potential greater sage-grouse habitat is limited along Route C. The line would traverse approximately 0.9 linear mile of silver sage and no big sage habitat types. There is one active greater sage-grouse lek within 2 miles of Route C (1.5 miles). This distance would preclude temporary or permanent disturbance of the lek.

Route C would result in the loss of 4.2 acres of silver sage habitat. There is anecdotal evidence that grouse may respond negatively to the presence of transmission line structures (Braun 1998; Connelly et al. 2004). The proposed transmission line could result in behavioral disturbance and effective fragmentation for sage grouse. The actual fragmentation effects are difficult to quantify, but could include disruption of movements between seasonal habitats (i.e., leks, nesting habitat, winter range, etc.). In the worst case, these effects would result in some reduction of breeding success, productivity, and survival. The distance of the transmission line from active grouse leks would somewhat reduce potential displacement and fragmentation effects. Route C would result in a low to moderate impact to sage grouse.

Site preparation and road construction along Route C could destroy grouse nests; however, the relatively small area of disturbance and the completion of pre-construction nest surveys and avoidance of occupied grouse nests (Appendix A) would reduce the potential for egg destruction and nest abandonment. In order to minimize potential disturbance effects, no construction activities would be permitted within 1 mile of an active lek between March 1 and May 1.

Transmission line structures can be utilized as perches by raptors and ravens, resulting in increased predation upon sage grouse (Connelly et al. 2004). In order to minimize potential for increased predation on sage grouse, perch prevention devices would be installed on any transmission line structure located within 1 mile of an active grouse lek. Mortality of grouse from collisions with transmission lines is known to occur, and would likely be correlated with the length of transmission line traversing grouse habitat and the density of grouse in that habitat. While it is not possible to quantify potential mortality, the distance of Transmission Route C from active leks would likely reduce the potential for collision-related mortality of sage-grouse. Mitigation measures (i.e., marker balls) will be implemented along transmission line segments that traverse silver sage habitat likely to be used by sage grouse.

Antelope Creek Substation

Vegetation

Vegetation would be impacted during construction of the substation (Table 3.7-6). Clearing, grading, and construction activities would result in the direct injury to or loss of vegetation, thereby altering the plant communities in the disturbed areas of Antelope Creek Substation. Vegetation in material laydown areas and staging areas for construction equipment would be temporarily disturbed. Vegetation in the direct construction footprint of the substation and parking areas would be permanently removed. Construction of the substation would remove approximately 5 acres of Wyoming big sagebrush-western wheatgrass vegetation. The majority of the disturbance would be long-term. The impacts to vegetation would be alleviated by leaving vegetation in place wherever possible and reseeding areas with ground disturbance in accordance with Western's construction standards (Appendix G).

The use of heavy equipment on areas of temporary disturbance could cause soil compaction that may affect plant survival and growth after construction completion. Soil compaction might directly affect the soil characteristics suitable for native plant growth and might reduce infiltration of water and nutrients into the soil. Compacted soils may also be susceptible to colonization by invasive species if measures are not taken to reduce establishment of these species. Implementation of proposed measures to control the introduction and spread of undesirable plants during construction would minimize potential adverse effects associated with invasive species.

Fugitive dust generated during clearing, grading and travel on Billingsley Road may impact vegetation. This potential impact would be greatest during construction of the substation and would be short-term and localized to the immediate area of the substation. Potential impacts to vegetation in the vicinity of the substation would be negligible through the implementation of appropriate dust control measures to minimize fugitive dust emissions from construction-related traffic and additional wind-blown dust as a result of ground disturbance (see Section 3.15).

During construction, operation, and maintenance activities, vegetation communities near the substation may be subject to exposure to contaminants. Construction equipment would need to be refueled and very small quantities of hazardous materials (such as waste paints and degreasing agents) may be generated (see Section 3.13). Accidental fuel spills (e.g., gasoline, diesel), pesticides, or releases of hazardous materials could result in the exposure of vegetation at the substation site, and reestablishment of the vegetation may be impacted or delayed because of residual soil contamination (Appendix G).

Project construction could introduce noxious weeds and invasive species to the site that, in turn, could alter existing vegetation communities in the substation area. No noxious weeds are known to occur in the substation area. Control measures implemented as part of Western's Construction Standards would minimize potential impacts from noxious/invasive species. Control measures include cleaning construction vehicles of all possible weed seeds; quickly revegetating disturbed areas; reclaiming areas with weed-free native grasses, forbs, and shrubs; and using certified weed-free mulch.

No Federally-listed endangered or threatened plant species are known to occur at the substation site; however, surveys have not been conducted. Pedestrian surveys for sensitive plant species would be conducted prior to the initiation of construction within all areas to be temporarily or permanently disturbed. Supervisory construction personnel would be instructed on the protection of rare or sensitive plants and the boundaries of rare or sensitive plant populations would be clearly delineated, in accordance with Western's Construction Standards (Appendix G).

Wildlife

Construction and operation of the substation would result in the loss of approximately 5 acres of sage-steppe habitat. Habitat quality at the site is low as a result of livestock grazing and the presence of the existing Richardson Coulee Substation and Billingsley Road. Few special status species potentially occur at the substation site. The nearest greater sage-grouse lek is 2.1 miles from the site. Pre-construction surveys would be completed to locate any sensitive resources (i.e., dens, nests). The proposed substation would result in a low adverse effect on wildlife.

Alternative A

Wind Farm and Antelope Creek Substation

Under Alternative A, impacts from the development of the proposed wind farm and Antelope Creek Substation would be identical to those described for the Proposed Action.

Transmission Route A

Vegetation

Impacts to vegetation associated with the construction, operations and maintenance of Route A would be similar to the impacts described for Route C (Table 3.7-12). The primary difference is associated with the increased length of this transmission line route and the subsequent greater number of acres disturbed. This longer route would result in 111.5 acres of permanent vegetation loss, primarily native mixed-grass prairie (Table 3.7-12). A BLM Watch Species, chaffweed, has been identified recently north of Dry Fork Creek. This location is several miles northeast of Route A; therefore transmission line construction and operations and maintenance activities are not expected to impact this population. Approximately 10 miles of Route A may cross through an extensive tract of northern porcupine grass-thickspike wheatgrass, a community that is considered important by the MNHP. The loss of northern porcupine grass-thickspike wheatgrass would be long-term within the construction footprint for transmission line structures and access roads. Leafy spurge occurs along this route and spotted knapweed has been documented in the vicinity. As previously discussed, control measures implemented as part of the Noxious Weed and Invasive Plant Control Plan would minimize potential impacts from noxious/invasive species (Appendix C).

Wildlife

Effects to wildlife associated with Route A would be similar to Route C. The primary differences are associated with the increased length of this transmission line route, which is 7.4 miles (22 percent) longer than Route C. The longer route would result in 111.5 acres of permanent habitat loss (Table 3.7-12).

Adverse effects upon birds would be slightly greater as a result of increased habitat loss and fragmentation. Route A would traverse more native grassland habitat, and could have a greater adverse effect on sharp-tailed grouse and other grassland wildlife species. The potential for avian collisions would be somewhat greater as a result of the longer line.

Route A would not disturb mule deer winter range, thereby having fewer potential effects than Route C to mule deer and bald eagles foraging on winter range. No greater sage-grouse leks occur within 2 miles of Route A This route would result in the loss of approximately 3.4 acres of silver sage habitat. A total of 5.3 linear miles of this transmission line route would be located within 2 miles of an active sharp-tailed grouse lek. Three sharp-tailed grouse leks occur within 2 miles of Route A, and the nearest lek is 0.3 mile from the line (Table 3.7-5).

3.8 Water Resources and Wetlands

3.8.1 Affected Environment

Water and wetland information was acquired from USGS topographic maps, National Wetlands Inventory (NWI) maps, Federal Emergency Management Agency (FEMA) maps, Flood Insurance Rate Maps (FIRMs), and the Natural Resources Conservation Service (NRCS). NWI and FEMA data coverage for the study area was incomplete. FEMA maps are available only for the southern half of the project area, while NWI maps are available only for the northern half of the project area. Other sources of data include existing documentation of regional features from public agencies, literature review, and consultation with U. S. Army Corps of Engineers (USACE) personnel. Jurisdictional wetland delineations were not conducted in the study area.

Surface Waters

The study area lies within the Milk River Basin. This basin comprises 22,232 square miles in northern Montana. The Milk River flows southeast and joins the Missouri River just below Fort Peck Dam. The tributaries to the Milk River draining the study area are all intermittent and ephemeral streams and coulees. Coulees are typified by flat-bottomed valleys enclosed by somewhat steep hillsides. The named rivers and streams potentially affected by the proposed VCWEP include: Milk River, Buggy Creek, Chisholm Creek, Antelope Creek, Vandalia South Canal, Cherry Creek, Wolf Creek, Crooked Creek, Spring Creek, Mooney Coulee, Chapman Coulee, Foss Coulee, Martin Coulee, Richardson Coulee, and Wire Grass Coulee. There are also many unnamed intermittent streams within the project area.

The USGS stream gage at Tampico measures peak flows of the Milk River in March and low flows in December. The hydrologic regime of the Milk River has been substantially altered by dams including Fresno Dam and Vandalia Diversion Dam. The dams have caused the river channel to become incised and have restricted seasonal flooding. Other sources of hydrologic modification within the study area are small in-stream impoundments for livestock.

Floodplains

The floodplain of the Milk River was formed by the ancient path of the Missouri River. FEMA floodplain data were available only for the southern portion of the project area. The Milk River and Antelope Creek have a wide (approximately 1 mile) 100-year floodplain within the project area. Smaller drainages to the

north, Spring Creek, Chapman Coulee, Foss Coulee, Mooney Coulee, and Richardson Coulee, have narrow 100-year floodplains as mapped by FEMA.

Wetlands

Under Section 404 of the Clean Water Act (CWA), and according to the EPA and the USACE, the regulatory definition of jurisdictional wetlands is "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

NWI data were available only for the northern portion of the project area. Wetlands identified by the NWI are an approximation of actual wetland areas and types and may or may not be jurisdictional based on the 1987 USACE Wetlands Delineation Manual (Environmental Laboratory 1987). The NWI identifies three wetland classes within the northern portion of the study area: palustrine aquatic bed (PAB), palustrine emergent (PEM), and palustrine unconsolidated shore (PUS). Characteristics of these three classes are:

- Aquatic bed – dominated by plants that grow principally on or below the surface of the water for most of the growing season.

- Emergent - dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. Usually dominated by perennial plants.

- Unconsolidated shore – substrates lacking vegetation except for pioneering plants that become established during brief periods when growing conditions are favorable.

Wetlands in the project area appear to be most commonly associated with streams and impoundments. The project area also lies within the prairie pothole region. Prairie potholes are isolated wetlands, often smaller than one acre, characterized by ephemeral or seasonal inundation. The NWI typically does not capture wetlands under an acre in size; therefore there is a potential for prairie pothole occurrences within the project area. Since most prairie potholes are not hydrologically connected to navigable waters, they are not considered jurisdictional by the USACE and not Federally regulated. However, prairie potholes still play an important role in the water resources of the region, and discharges of sediments and other pollutants to prairie potholes are regulated by the State of Montana.

Hydric soils are indicators of wetlands. The soils within the study area are mostly shallow to deep and well drained. Hydric soils are not common and are localized, as discussed in Section 3.10 Soils. Prior to project construction, a jurisdictional wetlands delineation would be conducted for all locations of proposed facilities and infrastructure by a qualified wetland delineator to identify wetlands potentially impacted by the project.

3.8.2 Environmental Consequences

Data from existing FEMA and NWI sources were digitized or imported into base maps created for the project. When data were available, potential impact locations were recorded and evaluated. However, surveys have not been conducted to determine the exact location of water resources and wetlands within the project area. Prior to project construction, all areas where project components would be located would be surveyed for the presence of wetlands by a qualified wetland delineator.

Factors considered in the impact analysis included the nature of the water resource; the intensity, duration, and frequency of impacts; and mitigation measures. Ground disturbance levels were estimated for the project area by considering topography, new or temporary road construction, and other estimated disturbance areas relating to construction.

Impacts to water resources and wetlands could result from sedimentation due to accelerated erosion and runoff caused by project-related activities on or adjacent to streams or wetlands. Wetland loss and alteration of wetland function and value could result from direct fill.

In areas where impacts to water resources and wetlands are possible, proposed mitigation measures are expected to be effective in reducing or eliminating those impacts.

Impact levels are classified as **High** if the action (i.e., construction, operation, maintenance, or abandonment of the project) would result in one or more of the following:

- There would be a substantial erosion hazard or loss of productive potential of a water resource or wetland;
- A water resource or wetland area would be destroyed by permanently filling all or most of it, or by permanently altering wetland hydrology; or
- A water resource or wetland area that serves as habitat for a rare plant or animal species would be destroyed.

Impacts are classified as **Moderate** if the action would result in one or both of the following:

- Some erosion hazard or loss of productive potential would occur; or
- A minor area of a water resource or wetland would be filled so that the majority of the wetland would still be able to function as a wetland.

Impacts are classified as **Low** if the action would result in one or both of the following:

- A small erosion hazard or loss of productive potential would occur; or
- A water resource or wetland would be temporarily filled or wetland hydrology, soils, or vegetation would be temporarily altered. This would be followed by restoring or enhancing the area.

Impacts are classified as **No Identifiable** where:

- No loss of soil or productive potential would occur;
- Direct impacts to wetlands would be avoided; or
- Water resources or wetland hydrology, vegetation, or soils would not be affected by nearby activities.

The information presented in this section satisfies Western's requirement under 10 CFR 1022 to incorporate in this EA a floodplain assessment of activities affecting floodplains. The additional requirements for a Statement of Findings regarding the floodplain assessment will be satisfied in the decision document that results from the NEPA/MEPA process.

No Action

Under the No Action Alternative, the VCWEP would not be constructed or operated. Therefore, no impacts to water resources would occur as a result of the proposed wind farm and transmission line development.

Proposed Action

Wind Farm

Phase I

Phase I would include the construction of 33 wind turbines spread over 1,094 acres and is anticipated to begin operation in 2008. The upper reaches of Buggy Creek and Canyon Creek would drain Phase I. Canyon Creek is a tributary to Buggy Creek. The NWI maps identify 6 wetland occurrences within Phase I as shown in Table 3.8-1.

Table 3.8-1 Wetland Occurrences in the Wind Farm Area

NWI Wetland Class	Description	Phase I	Phase II	Phase III	Phase IV	Full Build-out
PAB	Palustrine Aquatic Bed	1	2	4	10	17
PEM	Palustrine Emergent	4	11	8	19	42
PUS	Palustrine Unconsolidated Shore	1	0	0	0	1
Total		6	13	12	29	60

Source: NWI 2004 , NWI 1991 a-f.

Few direct impacts to water resources are expected. For optimum performance, turbine strings would be placed on high ground above stream drainages and would cause no direct disturbance of water resources. New access roads, internal roads and other facilities would be designed to avoid construction within stream drainages, wetlands, and riparian areas to the greatest extent practicable.

Potential indirect impacts to water resources could occur from increased runoff and sediment delivery to nearby streams and wetlands from areas disturbed by wind farm construction associated with the O&M building, collector substation, collector system, new access road, internal roads, wind turbine structures, and material staging areas. As shown in Table 2.3-4, Phase I would have a total of approximately 60 and 24 acres of temporary and permanent ground disturbance, respectively. These impacts would be short-term during the period of construction and reclamation

Potential indirect impacts to stream and wetland water quality could also occur from accidental spills of petroleum, oils, and lubricants (POLs) used for the fueling and maintenance of construction equipment and other chemical pollutants. These impacts would be minimized by implementation of a spill prevention plan and by staging equipment in upland areas. These indirect impacts would be short-term and generally low to moderate in intensity with the implementation of effective mitigation measures and monitoring during construction.

Impacts associated with wind farm construction and operation would be minimized through effective implementation of mitigation measures (Appendix A). The effectiveness of the mitigation measures would be monitored during construction by Wind Hunter and DEQ.

Mitigation measures would include the implementation of erosion and sediment control best management practices (BMPs) as part of the Stormwater Pollution Prevention Plan (SWPPP) required by DEQ for projects disturbing more than 1 acre. The SWPPP would be developed as part of the civil engineering process and would minimize the potential for pollutant discharge from the site during construction,

operation and maintenance activities, and decommissioning. Construction would occur from April through November, avoiding the wettest month of March. Construction would be halted if ground conditions become too wet for heavy equipment operation using criteria established in the POD. In addition, various measures and techniques are proposed where necessary and appropriate to avoid or minimize impacts as part of the VCWEP design (Appendix A).

Phase II

Phase II would consist of the construction of 63 wind turbines spread over 2,800 acres and is anticipated to begin operation in 2010. The upper reaches of Buggy Creek and Canyon Creek would drain Phase II. NWI maps identify 13 wetland occurrences within Phase II as shown in Table 3.8-1.

Potential impacts to these water resources from Phase II would be similar to those described for Phase I. However, the potential for indirect impacts from increased runoff and sediment delivery would be greater due to the larger area of total temporary and permanent ground disturbance (92 and 23 acres, respectively) and the greater number of wetlands within the area.

Phase III

Phase III would consist of the construction of 104 wind turbines spread over an area of 5,520 acres and is anticipated to begin operation in 2013. The upper reaches of Buggy Creek, Canyon Creek, and Chisholm Creek would drain Phase III. NWI maps identify 12 wetland occurrences within Phase III, as shown in Table 3.8-1.

Potential impacts to these water resources from Phase III would be similar to those described for Phase I. However, the potential for indirect impacts from increased runoff and sediment delivery would be greater due to the larger area of total temporary and permanent ground disturbance (156 and 46 acres, respectively) and the greater number of wetlands and receiving streams within the area.

Phase IV

Phase IV would consist of the construction of 134 wind turbines spread over 10,706 acres and is anticipated to begin operation in 2016. Buggy Creek and Canyon Creek would drain Phase IV. NWI maps identify 29 wetland occurrences within Phase IV as shown in Table 3.8-1.

Potential impacts to these water resources from Phase IV would be similar to those described for Phase I. However, the potential for indirect impacts from increased runoff and sediment delivery would be greater due to the larger area of total temporary and permanent ground disturbance (236 and 89 acres respectively) and the greater number of wetlands and receiving streams within the area.

Full Build-out

Full build-out would include Phases I through IV and involve the construction of a total of 334 turbines over 20,120 acres. Buggy Creek, Canyon Creek, and Chisholm Creek drain the full build-out area. The NWI maps identify a total of 60 wetland occurrences within the area of full build-out as shown in Table 3.8-1.

Full build-out would comprise the combined potential impacts on water resources from Phases I through IV. The area of temporary and permanent ground disturbance for full build-out would affect only 3 percent and less than 1 percent, respectively, of the total area of the wind farm. Overall, potential impacts to water resources would be primarily short-term and generally moderate in intensity with the implementation of effective mitigation measures and monitoring during construction. Few direct impacts to water resources are anticipated.

The 78 miles of new or improved internal gravel roads at full build-out would be permanent infrastructure for operation and maintenance of the wind farm. Gravel roads can be a potential long-term source of

sediment to nearby streams and wetlands if not properly maintained or designed. A compacted gravel road surface increases water runoff velocity and volumes, which also influences the amount of sediment reaching downstream waters. During construction, low water stream crossings would be used unless culverts are absolutely necessary. Also, roads would have cross drains where appropriate. Cross drains are surface devices designed to capture water that collects and drains down a road surface. The cross drain releases the water in a manner that minimizes the effects to nearby areas and the watershed. For low-volume roads, cross drains can be an economical method for avoiding the use of ditches and culverts. Wind Hunter would maintain the internal road network and inspect and repair roads on an annual basis or as needed, to minimize erosion of the road surface and sedimentation of downstream waters.

Transmission Route C

Transmission Route C has a total length of about 34.1 miles from the collector substation to the new Antelope Creek Substation. The first 29.0 miles from the collector substation south would use H-frame structures within a 110-foot right-of-way and the last 5.1 miles to the interconnection substation would use light-duty steel, single poles to reduce the necessary right-of-way to 80 feet for the crossing of the Milk River floodplain. The northernmost 4.6 miles from the collector substation south and the southernmost 9.8 miles from the proposed Antelope Creek Substation north and east would be the same as the corridor for Transmission Route A under Alternative A. Construction of the transmission line would proceed at the same time as construction of the wind turbines during Phase I.

The alignment of Transmission Route C crosses a total of 33 streams, including 4 streams with mapped floodplains as shown in Table 3.8-2. NWI maps are not available for the entire alignment. The available NWI data indicate that the alignment crosses six wetlands.

Table 3.8-2 Transmission Route C Stream Crossings

Stream Name	Stream Type	Mapped FEMA Floodplain	Crossings
Buggy Creek	Intermittent	No	1
Antelope Creek	Intermittent	Yes	1
Milk River	Perennial	Yes	1
Mooney Coulee	Intermittent	Yes	2
Vandalia South Canal	Canal	No	1
Unnamed canal	Canal	No	1
Crooked Creek	Intermittent	No	1
Spring Creek	Intermittent	Yes	1
Wire Grass Coulee	Intermittent	No	1
Wolf Creek	Intermittent	No	1
Unnamed streams	Intermittent	No	22
Total Crossings			33

Few direct impacts to water resources are expected. The placement of transmission structures would avoid streams, floodplains, wetlands, and riparian areas, and would allow conductors to span these features within the limits of standard tower design. Any necessary placement of structures within these water resources would be designed to minimize disturbance. For example, the right-of-way width within the Milk River floodplain crossing would be reduced from 110 feet to 80 feet. Single pole structures

within the Milk River floodplain would not substantially restrict flood flows or noticeably raise the flood elevation. The function of the floodplain would be retained.

Access roads would be used during construction and during periodic maintenance of the transmission line. Existing roads and trails would be used wherever feasible. Some access roads would be located within the right-of-way, but portions may need to be outside the right-of-way. New access roads would be revegetated following construction to minimize the potential for erosion and runoff. The road prisms would remain intact for access during routine patrols and maintenance.

Potential indirect impacts to these water resources could occur from increased runoff and sediment delivery to nearby streams and wetlands from areas disturbed by transmission line construction. As shown in Table 2.3-8, construction of Transmission Route C would result in 75.6 and 70.8 acres of temporary and permanent ground disturbance, respectively, from installation of structures, structure work areas, material storage, and access roads. Ground disturbance would be minimized by clearing vegetation only to the extent necessary to allow equipment to maneuver. Grading would be avoided during project design and would occur only where the topography is too steep or uneven to allow safe equipment operation. Upon completion of construction, all disturbed areas would be restored to the approximate original contours and revegetated using native species to minimize erosion and runoff. Wind Hunter would not initiate any construction or other ground disturbing activities until all authorizations, permits, reviews and government approvals are received, as discussed in Section 2.3.2. Wind Hunter would also be required to implement the proposed measures to reduce impacts under DEQ's Environmental Specifications, and DEQ would monitor transmission line construction to determine compliance with the terms and conditions of the MFSA Certificate of Compliance. In addition, various measures are proposed where necessary and appropriate to avoid or minimize impacts as part of the VCWEP design (Appendix A).

Potential indirect impacts to stream and wetland water quality could also occur from accidental spills of petroleum, oils, and lubricants (POLs) and other chemical pollutants. These impacts would be minimized by implementation of a spill prevention plan and by staging equipment in upland areas.

Overall, indirect impacts would be short-term during the period of construction and generally low to moderate in intensity with the implementation of effective mitigation measures and monitoring during construction.

Antelope Creek Substation

The proposed new substation at Antelope Creek would be located southwest of the Milk River about a 0.25-mile upgradient of an intermittent headwater drainage to Antelope Creek. The new substation would require excavation, grading and other site improvements to accommodate the required equipment within a fenced area of 5 acres. Construction would occur over a period of four to six months and would include grubbing vegetation and grading a pad and access road.

No direct impacts to water resources are anticipated as a result of constructing or operating the Antelope Creek Substation. Indirect impacts could potentially occur from accelerated soil erosion and sediment runoff to downstream waters. These impacts would be short-term, localized and of low intensity, and would be minimized by measures in Western's standard construction provisions (Standard 13, June 2003) (Appendix G). Overall, little cut or fill would be required for grading, minimizing ground disturbance. The grading plan may require drainage ditches outside the fenced area to redirect runoff away from the site. The drainage ditches would be designed to prevent erosion and sedimentation of receiving waters. Native vegetation would be used to stabilize slopes and minimize erosion, reducing the potential for impacts. A secondary containment berm would also be constructed around the facility to contain a transformer oil spill, preventing contamination of downstream waters.

Alternative A

Wind Farm and Antelope Creek Substation

Potential impacts from construction of the wind farm and Antelope Creek Substation under Alternative A are the same as those described for the Proposed Action.

Transmission Route A

The design of Transmission Route A would be similar to that of Transmission Route C except for location and distance. Transmission Route A would be about 40.5 miles long, 6.4 miles longer than Route C. The northernmost 4.6 miles from the collector substation south and the southernmost 9.8 miles from the proposed Antelope Creek Substation north and east would be the same as the corridor for Transmission Route C under the Proposed Action. Construction of the transmission line would proceed at the same time as construction of Phase I of the wind farm.

The alignment of Transmission Route A would cross 54 streams including 5 streams with mapped floodplains as shown in Table 3.8-3. NWI maps are not available for the entire alignment. The available NWI data indicates that the alignment would cross 10 wetlands.

Table 3.8-3 Transmission Route A Stream Crossings

Stream Name	Stream Type	Mapped FEMA Floodplain	Crossings
Buggy Creek	Intermittent	No	1
Antelope Creek	Intermittent	Yes	1
Milk River	Perennial	Yes	1
Mooney Coulee	Intermittent	Yes	3
Vandalia South Canal	Canal	No	1
Unnamed canal	Canal	No	1
Cherry Creek	Intermittent	No	1
Foss Coulee	Intermittent	Yes	5
Martin Coulee	Intermittent	No	1
Richardson Coulee	Intermittent	Yes	1
Wolf Creek	Intermittent	No	1
Unnamed streams	Intermittent	No	37
Total Crossings			54

Potential impacts to water resources would be similar to those discussed for Transmission Route C; however, the number of wetlands, streams, and floodplains crossed would be substantially greater, resulting in an increased potential for impacts. As shown in Table 2.3-10, construction of Transmission Route A would result in 88.8 and 108.9 acres of temporary and permanent disturbance, respectively. This is 13 acres of temporary disturbance and 38 acres of permanent ground disturbance more than Transmission Route C, resulting in a slightly greater potential for erosion and sediment runoff to downstream waters under Alternative A.

3.9 Geology and Geohazards

3.9.1 Affected Environment

The proposed VCWEP would be located within the Missouri Plateau section of the Great Plains physiographic province in northeast Montana. Geologic formations exposed in the area of the wind farm are Tertiary age sands and gravels. The Tertiary formations form protective caps overlying the erosive Cretaceous shale of the Bearpaw formation.

The VCWEP area and alternative transmission line routes can be broken into two distinct geomorphic environments. To the south the landscape is controlled by the meandering floodplain of the Milk River. This part of the study area is nearly flat farmland overlying recent flood deposits. The area north of the Milk River is dominated by gently sloping uplands of Cretaceous sediments. The Cretaceous sediments are capped with glacial tills and outwash deposits. As the more resistant tills are weathered away, softer more erosive sedimentary rocks are exposed, producing moderately incised drainage systems.

3.9.2 Environmental Consequences

Introduction

Analysis of the potential impacts of the alternative transmission corridors and wind farm phases was based largely on slope, geology and lithologic characteristics. Geologic maps of Valley County were acquired from the Montana Bureau of Mines and Geology (MBMG). The geologic maps were produced in digital ArcInfo format and were the primary source of data used to delineate geologic contacts within the VCWEP area. The USGS National Elevation Dataset (NED) was used to create a slope coverage. Assuming best road design would be on slopes less than 8 percent, slope polygons were produced using values of 0 to 8 percent, 8 to 15 percent, 15 to 30 percent, and greater than 30 percent. The geology data, together with slope information, were then draped over the VCWEP area using ArcInfo.

The greatest potential impacts to the geology of the area would result from the construction of new roads and upgrading of existing roads. Shales of the Bearpaw formation are known to be susceptible to mass wasting and slope failure. The high swelling and high plasticity of these shales, coupled with their high slaking potential, tend to produce slope failure in moderate to steep terrains. Areas of potential slope failure have been delineated and recorded. Factors taken into consideration are primarily lithologic characteristics, existing slope, and ground disturbance from new roads or improvement of existing roads.

The impact criteria that were used for geologic resources are:

> **High** impact would occur if the construction, operation, maintenance or abandonment of the VCWEP would cause substantial mass wasting or slope failure.
>
> **Moderate** impact would occur if the construction, operation, maintenance, or abandonment of the VCWEP would cause minor amounts of slope failure.
>
> **Low** impact would occur if the construction, operation, maintenance or abandonment of the VCWEP would cause a slight increase in erosion, rillwash or slumping.
>
> **No Identifiable** impact would occur where no formation is disturbed.

The most significant direct impact to geologic resources would potentially be large-scale erosion brought on by slope failure. This could occur from poor road construction in areas of steep terrain and unconsolidated clay shales. This type of high level, direct impact to the resource can be prevented through mitigation measures and onsite geotechnical surveys. Any new road building could have some minor impact on geologic resources. However, impacts can be minimized through road construction mitigation

measures, using the most effective and least environmentally damaging methods appropriate to that area. Mitigation measures could include designing new access roads to follow landform contours where practicable and closing new construction access roads that are not required for facility operation or maintenance.

No Action Alternative

No impacts to geologic resources would occur under the No Action Alternative.

Proposed Action

Wind Farm

Phase I

Data on slope and geology of the wind farm area for each construction phase are presented in Table 3.9-1. Most of the wind farm area is on slopes of less than 8 percent and on formations of Quaternary and Tertiary sands and gravels.

Table 3.9-1 Slope and Geology in the Wind Farm Area

Wind Farm Phase	Total Acres	0 to 8% Slope	8 to 15% Slope	15 to 30% Slope	Quaternary/Tertiary Sands and Gravels	Bearpaw Shale
I	1,094	97%	3%	--	75%	25%
II	2,800	97%	3%	--	80%	20%
III	5,520	94%	5%	1%	85%	15%
IV	10,706	89%	10%	1%	42%	58%
Full Build-Out	20,120	92%	7%	1%	61%	39%

Phase I would include the construction of 33 wind turbines spread over an area of 1,094 acres. Construction of wind turbines would be subject to mitigation measures (Appendix A) and geotechnical investigations, reducing potential impacts to geology. Potential impacts to geology from wind farm construction activities are anticipated to be low.

The greatest potential impact to the geology of the area would occur from the construction of the new primary access road from Kerr Road and the internal road network. Roads would cause 16.7 acres of temporary disturbance and 20.2 acres of permanent disturbance. Road construction located on shales would have the greatest potential for impact. Shale of the Bearpaw formation is known to be susceptible to mass wasting and slope failure. The high swelling and high plasticity characteristics of this shale, coupled with its high slaking potential, tend to produce slope failure in moderate to steep terrains. The layout of the internal road network for Phase I is conceptual (see Figure 2.3-1), but it is estimated that approximately 1-to-2 miles of the internal road network would be built on Bearpaw Shale.

A direct and high impact to geologic resources would be the potential for large-scale erosion brought on by slope failure. However, areas of potential slope failure would be delineated prior to construction and would be avoided to the greatest extent practicable. Geotechnical investigations would also be required for any new road construction on moderate to steep shale slopes. These investigations would evaluate onsite geology in order to properly design the roads to avoid slope failures. In addition, all road construction would be subject to committed mitigation measures (Appendix A), further reducing the potential for impacts. Overall, potential impacts to geology from road construction are anticipated to be moderate in intensity.

Phase II

Phase II would consist of the construction of 63 wind turbines on 2,800 acres. The slopes and geology of Phase II are the same as Phase I except for a lower proportion of Bearpaw Shale (Table 3.9-1). The layout of the internal road network for Phase II is conceptual (see Figure 2.3-1), but it is estimated that approximately 2 miles of the internal road network would be built on Bearpaw Shale.

Potential impacts to geology from Phase II would be similar to those described for Phase I. Phase II roads would result in 12.7 acres of temporary and 22.9 acres of permanent disturbance. However, the potential for high impacts from slope failure would be slightly less than during Phase I due to the lower proportion of Bearpaw Shale.

Phase III

Phase III would include the construction of 104 wind turbines over 5,520 acres. A slightly greater percentage of the slopes of Phase III are moderate to steep; however, a lower percentage is located on Bearpaw Shale.

Potential impacts to geology from Phase III would be similar to those described for Phase I. Road construction would cause 25.2 acres of temporary disturbance and 45.4 acres of permanent disturbance. However, the potential for high impacts from slope failure would be slightly less due to the lower proportion of shale. The layout of the internal road network for Phase III is conceptual (see Figure 2.3-1), but it is estimated that approximately 3 miles of the internal road network would be built on Bearpaw Shale.

Phase IV

Phase IV would consist of the construction of 134 wind turbines spread over 10,706 acres. Approximately 11 percent of Phase IV is located on moderate to steep slopes and more than half the area (58 percent) is located on Bearpaw Shale. The layout of the internal road network for Phase IV is conceptual (see Figure 2.3-1), but it is estimated that approximately 20 to 25 miles of the internal road network would be built on Bearpaw Shale.

Potential impacts to geology from Phase IV would be similar to those described for Phase I; however, there would be a much greater potential for slope failure from road construction on Bearpaw Shale on moderate to steep slopes. Roads would result in 49 acres of temporary disturbance and 88.1 acres of permanent disturbance.

Full Build-out

Full build-out would include Phases I through IV and would entail the construction of 334 turbines over a total area of 20,120 acres. Full build-out would comprise the combined impacts from Phases I through IV. Overall, potential impacts to geology are anticipated to be moderate if road construction is avoided in areas of Bearpaw Shale with moderate to steep slopes and if mitigation measures are implemented effectively (Appendix A).

Transmission Route C

Transmission Route C is about 34.1 miles long and traverses a total of 1.1 miles of slopes greater than 8 percent. Access would require 1.0 mile of new road construction on slopes greater than 8 percent and 0.8 mile of new road construction on Bearpaw Shale with slopes greater than 8 percent, which would have a high potential impact on geology from slope failure.

All new road construction would be subject to committed mitigation measures (Appendix A), and new road construction on moderate to steep shale slopes would require geotechnical investigations. These investigations would evaluate the onsite geology to properly design the roads to avoid slope failures. Under these conditions, new road construction is anticipated to have low to moderate impact on local geology. In addition, Wind Hunter would be required to implement the proposed measures to reduce impacts under DEQ's Environmental Specifications, and DEQ would monitor transmission line construction to determine compliance with the terms and conditions of the MFSA Certificate of Compliance. In many cases, the steepest slopes that would be most subject to failure could be spanned by the line, and roads would not be necessary on the steepest slopes.

Antelope Creek Substation

Because the proposed site of the Antelope Creek Substation is underlain by relatively stable till and alluvium deposits, no geological resources would be impacted by the construction of the substation.

Alternative A

Wind Farm and Antelope Creek Substation

Under Alternative A, impacts associated with wind farm and substation construction, operation, maintenance, and decommissioning would be identical to those discussed for the Proposed Action.

Transmission Route A

Transmission Route A is about 40.5 miles long and traverses a total of 1.6 miles of slopes greater than 8 percent. Four sections of this route are located on Bearpaw Shale on slopes greater than 8 percent. These are near milepost 1.4, 2.5, 16.4, and 25.2 (Link 2). A total of 5.3 miles of Bearpaw Shale are crossed. Access to these areas would require 1.2 miles of new road construction on Bearpaw Shale with slopes greater than 8 percent, which would have a potentially high impact on geology from slope failure.

All new road construction would be subject to committed, mitigation measures (Appendix A), and new road construction on moderate to steep shale slopes would require geotechnical investigations. Requirements would be similar to those discussed under Transmission Route C.

3.10 Soils

3.10.1 Affected Environment

The portion of the VCWEP area that includes the proposed wind farm is typically nearly level to hilly with shallow to deep well-drained soils on glaciated plains and shale uplands. Soils in this portion of the project area fall into three broad categories:

- Deep, nearly level to hilly soils on uplands that formed in glacial till.
- Deep, nearly level to strongly sloping soils on uplands that formed in glacial till.
- Shallow to deep, nearly level to hilly soils formed in parent material weathered from clay shale and in glacial till on uplands.

The portion of the project area near Transmission Routes A and C is dominated by two different landforms: the Milk River area and the uplands. The area along the Milk River is nearly level to gently sloping, with deep well-drained soils located on floodplains, associated fans, and low terraces. Soils along the Milk River fall into two broad categories:

- Level soils that formed in alluvium on floodplains and low terraces.
- Nearly level to gently sloping soils that formed in alluvium on fans and low terraces.

The upland portions of the transmission corridors are level to hilly, with shallow to deep well-drained soils that formed on glaciated plains and shale uplands. Soils in the uplands fall into four broad categories:

- Deep, nearly level to hilly soils that formed in glacial till.
- Deep, nearly level to strongly sloping soils that formed in glacial till.
- Deep soils on nearly level to strongly rolling lands that formed in glacial till.
- Shallow to deep, nearly level to hilly soils formed in parent material weathered from clay shale and in glacial till.

The area near the proposed substation is nearly level, with deep well-drained soils that formed on glaciated plains and shale uplands. These soils fall into one broad category: deep, upland soils on nearly level to strongly rolling lands that formed in glacial till.

3.10.2 Environmental Consequences

Introduction

The primary concern regarding soil resources is to avoid or minimize potential impacts related to wind and water erosion, compaction, and rutting during and after construction. Factors considered in analyzing the impact include areas and types of ground disturbance; soil type and condition; erosion hazards of specific soil types; the intensity, duration and frequency of impacts; and mitigation measures. Initial impact levels were estimated by combining projected ground disturbance levels, soil characteristics (particularly soil erosion hazard), and generic mitigation measures.(Appendix A) Possible selective mitigation measures were then evaluated to determine if projected impacts to soil resources could be further reduced. Initial and residual impacts are one and the same where no selectively committed mitigation measures are proposed. Actual reductions in impacts to soil resources would vary based on several factors: soil type and condition (e.g., moisture content), vegetation cover, landscape position, weather, the nature and severity of the disturbance, and the type and execution of the applied mitigation measure.

Impact levels to soil resources are defined as follows:

- **High** impact would result if the construction, operation, maintenance, or abandonment of the VCWEP would potentially cause a substantial erosion hazard or loss of soil productive potential.
- **Moderate** impact would result if the construction, operation, maintenance, or abandonment of the VCWEP would potentially cause some erosion hazard or loss of soil productive potential.
- **Low** impact would result if the construction, operation, maintenance, or abandonment of the VCWEP would potentially cause a small erosion hazard or loss of soil productive potential.

- **No Identifiable** impact would be indicated where no loss of soil or productive potential would occur.

For soil map units affected by the VCWEP, soil surface disturbance, compaction, and erosion would occur to varying degrees. These disturbances would likely result in an increase in wind and water erosion rates and compaction levels and in the relocation of soil resources.

Direct impacts to soil resources would result from construction activities. Construction activities associated with the wind farm would include road building, erecting the wind turbines and associated collector infrastructure, and constructing an O&M building. Construction activities associated with Transmission Routes A and C would include road building, transmission structure installation, material lay-down areas, conductor pulling and tensioning, and construction staging. These direct impacts would be temporary during construction and permanent where wind turbines, roads, transmission structures, and other facilities are placed.

The following describes the conditions associated with estimating impact levels:

High Impact

- Construction activities in steep terrain.
- High to moderate soil erosion potential.

Moderate Impact

- Construction activities in flat to moderately sloping terrain.
- Moderate soil erosion potential.

Low Impact

- Ancillary activities related to construction. An example would be using unimproved existing roads or overland travel.
- Moderate to low soil erosion potential.

No Action Alternative

No impacts to soil resources related to the VCWEP would occur under the No Action Alternative.

Proposed Action

Wind Farm

Table 3.10-1 summarizes the erosion potential of soils and the area of temporary and permanent ground disturbance within each phase of wind farm construction.

Soil resource impacts would be reduced by the implementation of erosion and sediment control BMPs as part of the SWPPP required by DEQ for projects disturbing more than 1 acre. The SWPPP would be developed as part of the civil engineering process and would be based on the specific soil disturbance conditions and the nature of construction, operation and maintenance, or decommissioning. Applicable plans would be provided to appropriate agencies, such as DNRC and BLM, for review and approval. BMPs will be specified in BLM and DNRC's POD and Western's MAP. BLM, DEQ and DNRC would monitor construction activities for compliance with the required plans and specifications. In addition, various measures are proposed where necessary and appropriate to avoid or minimize impacts as part of the VCWEP design (Appendix A).

Table 3.10-1 Erosion Potential and Soil Disturbance in Wind Farm Area

	Erosion Potential (Acres)			Ground Disturbance (Acres)	
	Low	**Moderate**	**High**	**Temporary**	**Permanent**
Phase I	--	824	268	60	24
Phase II	30	2,152	618	92	23
Phase III	16	3,939	1,564	156	46
Phase IV	--	5,774	4,913	236	89
Full Build-Out	46	12,689	7,363	544	183

Phase I

The majority (75 percent) of soils within Phase I have moderate erosion potential and the remaining 25 percent have high erosion potential. Construction of Phase I would disturb approximately 8 percent of the soils in Phase I. Ground disturbance would be mostly temporary so potential impacts would primarily be short-term.

Phase II

The majority (77 percent) of soils within Phase II have moderate erosion potential. The remaining soils have high (22 percent) and low (1 percent) erosion potential (Table 3.10-1). Construction of Phase II would disturb approximately 4 percent of the soils in Phase II. Ground disturbance would be mostly temporary so potential impacts would primarily be short-term.

Phase III

The majority (71 percent) of soils within Phase III have moderate erosion potential. The rest have high (28 percent) or low (1 percent) erosion potential (Table 3.10-1). Construction of Phase III of the wind farm would disturb approximately 4 percent of the soils in Phase III. Ground disturbance would be mostly temporary so potential impacts would primarily be short-term.

Phase IV

More than half (54 percent) of soils within Phase IV have moderate erosion potential and the remaining 46 percent have high erosion potential (Table 3.10-1). Construction would disturb approximately 3 percent of the soils in Phase IV. Of all phases, Phase IV contains the highest percentage of soils with a high erosion potential and therefore the greatest risk for erosion during construction. Ground disturbance would be mostly temporary so potential effects would generally be short-term.

Full Build-out

Overall, the majority (63 percent) of soils within the entire wind farm at full build-out would have moderate erosion potential. The rest would have high (37 percent) or low (1 percent) erosion potential (Table 3.10-1). Full build-out of the wind farm would disturb approximately 4 percent of the soils. The majority of affected soils would have moderate erosion potential. Ground disturbance would be mostly temporary so potential effects would primarily be short-term.

The 78 miles of total new or improved internal gravel roads at full build-out would be permanent infrastructure for operation and maintenance of the wind farm. Roads would have a long-term, moderate

impact on soils from compaction and potential erosion if not maintained properly or designed with adequate cross drains. Wind Hunter would maintain the internal road network by inspecting and repairing roads on an annual basis, or as needed, to minimize erosion of the road surface.

Transmission Route C

Temporary and permanent ground disturbance acreages by soil erosion potential within Transmission Route C alignment are shown in Table 3.10-2. Approximately 75 percent of the temporary disturbance would occur on soils with moderate erosion potential. Another 24 percent and 1 percent of temporarily disturbed soil have a high and low erosion potential, respectively. Approximately 54 percent of the permanent disturbance would occur on soils with moderate soil erosion potential and 45 percent on soils with a high erosion potential. Permanent disturbance would result from the presence of access roads. The access road prisms would remain intact during routine patrols and maintenance. The roads would be revegetated following construction to reduce erosion potential.

Erosion control BMPs would be implemented to reduce impacts to soils of moderate to high erosion potential. The degree of impact reduction would depend in large part on the effectiveness and maintenance of the BMPs. Wind Hunter would also be required to implement the proposed measures to reduce impacts under DEQ's Environmental Specifications, and DEQ would monitor transmission line construction to determine compliance with the terms and conditions of the MFSA Certificate of Compliance. In addition, various measures or techniques are proposed where necessary and appropriate to avoid or minimize impacts as part of the VCWEP design (Appendix A).

Table 3.10-2 Erosion Potential and Ground Disturbance for Alternative Transmission Routes (acres)

	Temporary Ground Disturbance			Permanent Ground Disturbance		
	Erosion Potential			Erosion Potential		
	Low	Moderate	High	Low	Moderate	High
Transmission Route C	1	49	16	1	38	32
Transmission Route A	0	59	20	0	63	46

Antelope Creek Substation

Approximately 5 acres of direct impacts to soil resources would occur as a result of substation construction, including excavation, grading, and placement of approximately 6 inches of crushed rock and gravel on the soil surface. Implementation of BMPs would reduce potential impacts to soil resources. No selectively committed mitigation measures are proposed for the Antelope Creek Substation.

Alternative A

Wind Farm and Antelope Creek Substation

Under Alternative A, impacts from the development of the proposed wind farm and Antelope Creek Substation would be identical to those described for the Proposed Action.

Transmission Route A

The construction activities and impact types for Transmission Route A would be similar to those of Transmission Route C except for location and distance. Transmission Route A would be about 40.5 miles long, 6.4 miles longer than Route C. The northernmost 4.6 miles from the collector substation south and

the southernmost 9.8 miles from the proposed Antelope Creek substation north and east would be the same as the corridor for Transmission Route C under the Proposed Action.

Temporary and permanent ground disturbance acreages by soil erosion potential within the Transmission Route A alignment are shown in Table 3.10-2. Route A would require 13 more acres of temporary soil disturbance and 38 more acres of permanent disturbance than Route C. Approximately 75 percent of the temporary disturbance would occur on soils with moderate erosion potential and the remaining 25 percent on soils with a high erosion potential. Approximately 58 percent of the permanent disturbance would occur on soils with moderate soil erosion potential and 42 percent on soils with a high erosion potential. Permanent disturbance would primarily result from the presence of access roads The road prisms would remain intact for access during routine patrols and maintenance, but the roads would be revegetated following construction to reduce erosion potential.

Erosion control BMPs would be implemented to reduce impacts to soils of moderate to high erosion potential. Wind Hunter would also be required to implement the proposed measures to reduce impacts under DEQ's Environmental Specifications, and DEQ would monitor transmission line construction to determine compliance with the MFSA Certificate of Compliance.

3.11 Paleontology

3.11.1 Affected Environment

Paleontological resources (i.e., fossils) are the remains, traces, or imprints of plants or animals that have been preserved in a geologic context and are more than 10,000 years old. No previously recorded fossil localities occur within the VCWEP area. In this section, each geologic formation in the VCWEP area is described and evaluated with respect to its potential to contain fossils and the probability that those fossils are significant. Based on literature reviews, file searches, and personal communications, these two aspects of each formation are ranked as low to none, low, low to moderate, moderate, moderate to high, or high. These rankings are the basis for the paleontological resource sensitivity rating, which is assigned to each geologic formation and used in the impact assessment. Guidelines for determining the significance of paleontological resources, presented in Table 3.11-1, emphasize the types of paleontological materials (e.g., vertebrate, invertebrate, plant) and the research or education potential of the materials. National Register of Historic Places (NRHP) eligibility (see Section 3.12) is sometimes considered if the paleontological materials are associated with a famous person or event. The process of assessing resource sensitivity is presented in more detail below.

The following geologic units, from oldest to youngest, occur in or near the VCWEP area: Cretaceous Claggett Shale, Judith River Formation, and Bearpaw Shale; Tertiary Flaxville Formation; and Quaternary alluvial, colluvial, glacial, and landslide deposits (Bergantino 1999, 2001; Ross et al. 1955). All these units except for Claggett Shale have surface exposures within the wind farm or transmission line areas. A review of published work on the paleontology and geology of the area and file searches at the Montana SHPO and DNRC indicate that no previously recorded paleontological localities occur within the VCWEP area boundaries. Paleontological resource permit application files at the BLM Montana State Office reveal that several permits include Valley County, but no specific paleontological localities in the VCWEP area are documented. Correspondence with BLM permit holders verified the absence of previously recorded localities (J. Constenius, personal communication 2004; K. Constenius, personal communication 2004; R. Hilton, personal communication 2004). Local museums, including Fort Peck Field Station of Paleontology, Fort Peck Dam Interpretive Center, and Judith River Dinosaur Institute (Malta), have not searched for fossils in the VCWEP area (C. Morrow, personal communication 2004; N. Murphy, personal communication 2004). Finally, Montana's State Paleontologist is not aware of any sites within the VCWEP area (J.Horner, personal communication 2004).

Cretaceous Period

In Montana during the Late Cretaceous Period, transgressions during high sea levels resulted in marine sediments being deposited farther west, while regressions during low sea levels allowed terrestrial sediments to be deposited farther east (Horner et al. 2001). These cycles caused changes in available terrestrial habitat that led to evolutionary changes in some groups of dinosaurs (Varricchio 1993). The Cretaceous units exposed in the VCWEP area are part of the Montana Group, a series of interfingering nonmarine and marine rocks consisting of "…eastward-pointing wedges of regressive deposits of nonmarine and shallow-water marine strata (Telegraph Creek, Eagle, Parkman, Judith River, Two Medicine, and Fox Hills and its equivalents) that enclose westward-thinning wedges of fine-grained transgressive deposits of marine strata (Claggett and Bearpaw Shales) (Gill and Cobban 1973)." These units often contain distinct beds of volcanic ash (bentonite) (Gill and Cobban 1973; Rogers 1998).

The Claggett Shale (120 meters thick) is composed of dark gray marine and brackish water sediments (shales and intercalated sandstones) deposited as early as 80 million years ago (Ma) and continuing until 75.4 Ma in the extreme eastern part of the state (Bergantino 1999; Gill and Cobban 1973; Hagener 1979; Horner et al. 2001; Sahni 1972). The Claggett Shale is reportedly quite fossiliferous and has produced remains of invertebrates, champsosaurs, and water ferns (Balster 1971; Hagener 1979; Hall 1969). Marine reptiles are also likely to occur. Although the Claggett Shale has a moderate to high potential for producing fossil material, the probability that the material would be significant is only low to moderate (Table 3.11-1). This prediction of significance is based on the relative abundance of invertebrate material in this formation. Also, there are no surface exposures of Claggett Shale in the wind farm and transmission line areas.

The Judith River Formation is a nonmarine deposit containing fossilized plants (water fern, fern, conifer, angiosperm), invertebrates (mollusk, insect), and vertebrates (fish, shark, amphibian, turtle, champsosaur, crocodile, lizard, dinosaur, mammal, bird, marine reptile) (Clemens and Goodwin 1985; Fiorillo 1997; Hagener 1979; Hall 1969; Horner 1989; Sahni 1972). The formation ranges in thickness from 140 meters on the west side of the VCWEP area to 80 meters on the east (Bergantino 2001). The package of sediments in the VCWEP area probably dates to between 77 and 75 Ma. Several notable dinosaur specimens have been recovered from the Judith River Formation north of Malta, including a duck-billed dinosaur with fossilized soft tissue (Murphy et al. 2002). The transitional nature of the deposits from terrestrial coastal plain on the west to marine on the east is well demonstrated in exposures of the Judith River Formation near Rudyard, Montana, where sharks and a marine reptile (plesiosaur) have been collected (Clemens and Goodwin 1985). The Judith River Formation has a high potential to contain fossils, and a moderate to high probability that the fossil material would be significant. (Table 3.11-1).

The Bearpaw Shale formed in a marine setting 75.4 to 74.0 Ma and is 340 meters thick in the VCWEP area (Bergantino 2001; Horner et al. 2001). Marine reptiles (mosasaurs, plesiosaurs), gastroliths (stomach stones), shark teeth, marine turtles, mollusks, and even dinosaurs occur in the Bearpaw Shale, which was deposited on top of the Judith River Formation (Darby and Ojakangas 1980; Hagener 1979; Horner 1979, 1989; Jensen and Varnes 1964; Nicholls et al. 1990; Pierce 2002; Russell 1970; Tokaryk 1987). The Bearpaw Shale is similar to the Claggett Shale (Sahni 1972:335), but the Bearpaw Shale exceeds the Claggett in thickness, fossil abundance, and faunal diversity (Bowen 1915). The Bearpaw Shale extends much farther west than the Claggett (Gill and Cobban 1973; Varricchio 1993). The Bearpaw Shale has high potential for producing fossil material, with moderate probability that the fossils would be considered significant (Table 3.11-1).

Table 3.11-1 Guidelines for Determining Significance and Integrity of Paleontological Resources

Paleontological remains are defined by the Montana Antiquities Act, as amended (1995), as "...fossilized plants and animals of a geological nature found upon or beneath the earth or under water which are rare and critical to scientific research". Significance is defined as the estimation of scientific or educational importance of paleontological materials under the National Environmental Policy Act (1969) and the Federal Land Policy and Management Act (1976). The following guidelines also address paleontological resource management information presented in several federal documents (Bureau of Land Management 1998a, 1998b; U. S. Department of the Interior 2000; Kuntz et al. 1989). Fossil resources that meet significance Criteria I and II may also be considered significant under the National Historic Preservation Act (NHPA) as amended (2001) (i.e., see significance Criterion III). Once significance is established, integrity (i.e., the ability of the site to convey scientific, educational, or historical values) is evaluated.

SIGNIFICANCE

I. Materials Inventoried

A) Vertebrate material
- i. cranial material (i.e., partial or complete skull or jaw)
- ii. articulated or complete (>25%) skeleton
- iii. concentration of vertebrate material
- iv. unique or rare occurrence, including trace fossils
- v. intimate association with paleoenvironment
- vi. coprolite(s)

B) Invertebrate material
- i. good-excellent preservation of shell material
- ii. concentrations of diverse material
- iii. unique or rare occurrence, including certain trace fossils
- iv. intimate association with paleoenvironment
- v. important stratigraphic marker

C) Plant material
- i. well preserved plant material
- ii. petrified wood
- iii. fossil stump(s)
- iv. intimate association with paleoenvironment
- v. important association of fossil plant and animal materials
- vi. coprolite(s)

II. Research or Education Potential

A) material contributes to faunal or floral lists
B) material significantly contributes to the systematics of group(s) collected
C) material contributes to knowledge of the functional anatomy of the organism
D) material contributes to knowledge of biostratigraphy, biogeography, paleoecology, paleoenvironment,
or phylogeny
E) material contributes to taphonomic analysis
F) material contributes to a potential museum exhibit or educational activity

III. Eligible for the National Register of Historic Places under Criteria A or B

A) Association with an event that has made a significant contribution to the broad patterns of our history. Refer to Section 106 regulations, 36 CFR Part 800, of the NHPA, as amended (2001).
B) Association with the lives of persons significant in our past. Refer to Section 106 regulations, 36 CFR Part 800, of the NHPA, as amended (2001).

INTEGRITY

I. Site retains the ability to convey values that make it significant (e.g., site continues to produce important fossil material)

II. If the site is important for its association with an event, historical pattern, or person(s), and is potentially eligible for the National Register of Historic Places, it should retain some combination of the aspects of integrity (i.e., location, design, setting, materials, workmanship, feeling, association).

Tertiary Period

During the Late Tertiary Period, the Flaxville Formation formed by deposition of gravels and sands by rivers. Although the age of this formation is uncertain, it is thought to have formed during the Miocene and Pliocene epochs between 15 and 1.8 Ma. The climate during deposition of the Flaxville Formation may have been very dry, and it is inferred that "…shifting desert streams spread a thick blanket of coarse gravel across the region (Alt and Hyndman 1986:23)."

The Flaxville Formation is up to 30 meters thick in the VCWEP area, and consists of locally cemented gravel, sand, clay, marl, lignite, and volcanic ash (Colton 1962; Collier and Thom 1918). The Flaxville Formation caps even-topped plateaus and unconformably overlies the Fort Union, Hell Creek, or Bearpaw formations (Collier and Thom 1918). Sediments comprising this formation were deposited by rivers and formed either as a continuous sheet subsequently dissected by erosion (Colton 1962; Perry 1962), or as discrete deposits (Storer 1969). Isolated, poorly preserved, and often fragmentary fossil material recovered from this formation includes rhinoceros, horse, camel, oreodont, gopher, rabbit, saber-tooth cat, canid, and fish (Brown 1952; Collier and Thom 1918; Storer 1969). A late Miocene to Pliocene age (15 to 1.8 Ma) has been reported, although it is possible that this formation could be considerably younger (Brown 1952; Collier and Thom 1918; Colton 1962; Denson and Gill 1965; Storer 1969; Witkind 1959). The Flaxville Formation has a low potential for producing fossil material, and a low probability for producing significant fossils (Table 3.11-1).

Quaternary Period

Climatic conditions during the Pleistocene Epoch (1.8 Ma to 10,000 years ago) of the Quaternary Period were moister and cooler than at present (Alt and Hyndman 1986). Large continental ice sheets formed in central Canada and spread into northern Montana during the Bull Lake (maximum 130,000 to 70,000 years ago) and Pinedale (maximum about 15,000 years ago) ice ages (Alden 1932; Alt and Hyndman 1986). These large masses of ice disrupted river courses and in many instances formed glacial lakes. Between Havre and Fort Peck, the Milk River now occupies the pre-ice age valley of the Missouri River, which was pushed southward by the ice sheets in the Pleistocene (Alden 1932).

Quaternary deposits in the VCWEP area are variable in thickness and include alluvium, colluvium, landslides, glacial till, glacial outwash, and glacial moraines (Alden 1932; Bergantino 1999, 2001). Quaternary landslides usually involve older bedrock so they are not considered here. Glacial deposits overlie much of the bedrock in the VCWEP area (Bergantino 2001). Continental glaciation during the Bull Lake ice age was more extensive than the later Pinedale ice age. During the Bull Lake episode, the ice sheet probably extended south of Glasgow (Alden 1932). Glacial deposits from the Pinedale ice age are not as well defined in the VCWEP area. Some of the Quaternary deposits may contain Pleistocene fauna, such as mammoth, mastodon, ground sloth, giant short-faced bear, wolf, coyote, bobcat, cheetah, saber-tooth cat, horse, camel, deer, caribou, pronghorn antelope, bison, shrew, and rodents (Denson and Gill 1965; Hill 2001; Jensen and Varnes 1964; Rasmussen 1974; Wilson and Hill 2000). Given the extent of the continental ice sheets, the potential for discovery of Pleistocene fossils in the VCWEP area is predicted to be low, and the probability that the fossil material would be significant is low to moderate. Holocene-age (after 10,000 years ago) alluvium is too young to contain fossils in primary context. It is characterized as having a "low to none" potential for fossil potential and "low to none" significance probability.

Paleontological Resource Sensitivity Rating

A paleontological resource sensitivity rating is assigned to each geologic formation, and is based on the potential of the unit to contain fossils and the probability that those fossils would be considered significant (Table 3.11-2). Table 3.11-3 summarizes fossil potential, significance probability, and paleontological resource sensitivity for each geologic map unit defined by Bergantino (1999, 2001) in the VCWEP area: Kcl (Cretaceous Claggett Shale), Kjr (Cretaceous Judith River Formation), Kb (Cretaceous

Bearpaw Shale), Tsg/Tf (Tertiary Flaxville Formation and possible Pleistocene Deposits), and Qsg/Qac/Qg/Qal (Quaternary Deposits).

The Claggett Shale (Kcl) has moderate paleontological resource sensitivity, but is not mapped as being exposed at the ground surface within the VCWEP boundaries. It will not be discussed further. The Judith River Formation (Kjr) has a high sensitivity rating, and the Bearpaw Shale (Kb) has a moderate rating. As discussed in the previous section, the Flaxville Formation has a low potential to produce fossil material, and there is a low probability that fossils from this formation would be significant. However, the Tsg and Tf map unit descriptions state that although this unit is thought to be Miocene-Pliocene (Tertiary) in age and equivalent to the Flaxville Formation, it may include Pleistocene (Quaternary) sands and gravels (Bergantino 1999, 2001). The possible presence of Pleistocene-age deposits in map units Tsg and Tf increases their paleontological resource sensitivity rating to moderate. Quaternary deposits in the VCWEP area are mapped as Qsg (Pleistocene-Holocene terrace deposits, glacial outwash, and colluvium), Qac (Pleistocene-Holocene alluvium, colluvium, and possibly glacial outwash), Qg (Pleistocene glacial deposits), and Qal (Holocene alluvium). Map units Qsg, Qac, and Qg all have moderate paleontological resource sensitivity. Since map unit Qal is Holocene (recent) in age, it is excluded from this analysis. Unit Qal is assigned a paleontological resource sensitivity rating of “none” (Tables 3.11-2 and 3.11-3).

Table 3.11-2 Paleontological Resource Sensitivity Matrix.

	Significance Probability					
Fossil Potential	**Low to None**	**Low**	**Low to Moderate**	**Moderate**	**Moderate to High**	**High**
Low to None	None	Low	Moderate	Moderate	Moderate	Moderate
Low	Low to None	Low	Moderate	Moderate	Moderate	Moderate
Low to Moderate	Low	Moderate	Moderate	Moderate	Moderate	Moderate
Moderate	Low	Moderate	Moderate	Moderate	Moderate	Moderate
Moderate to High	Low to Moderate	Moderate	Moderate	Moderate	Moderate	High
High	Low to Moderate	Moderate	Moderate	Moderate	High	High

Table 3.11-3 Fossil Predictions According to Geologic Map Unit.

Geologic Map Units (Bergantino 1999, 2001)	**Fossil Predictions**		
	Fossil Potential	**Significance Probability**	**Resource Sensitivity**
Claggett Shale (Kcl)	Moderate to High	Low to Moderate	Moderate
Judith River Formation (Kjr)	High	Moderate to High	High
Bearpaw Shale (Kb)	High	Moderate	Moderate
Flaxville Formation (Tsg* and Tf*)	Low	Low to Moderate*	Moderate*
Quaternary Deposits (Qsg, Qac, and Qg)	Low	Low to Moderate	Moderate
Quaternary Alluvium (Qal)	Low to None	Low to None	None

*Thought to be Miocene-Pliocene in age, but may include Pleistocene sands and gravels (Bergantino 1999, 2001); fossil prediction categories have been adjusted to reflect this possibility.

This inventory is based solely on literature review; no field survey was undertaken. Literature review included evaluating geologic maps, searching GeoRef bibliographic database, and conducting file searches with the Montana SHPO, DNRC, and BLM. In addition, each geologic unit/formation exposed at the ground surface is evaluated with respect to its potential to contain buried paleontological remains. Although almost all sedimentary units have at least some potential for preservation of paleontological resources (Lyman 1994), the fossils may or may not be rare or critical to scientific research (i.e., significant). Thus, a geologic unit may have low potential for presence of fossils, but a high probability that those remains, if discovered, would be significant. Guidelines for determining significance and integrity of paleontological resources are presented in Table 3.11-1.

3.11.2 Environmental Consequences

Introduction

The following paleontological resource assessment evaluates the direct and reasonably foreseeable indirect impacts that may result from the VCWEP. Impact types associated with this project include ground disturbing activities, increased access into remote areas, and operation-related activities. Application of mitigation measures would substantially decrease initial impact levels to lower residual impact levels.

Impacts from ground disturbing activities have the highest potential to disturb paleontological resources, and could be direct, adverse, and long-term. Impacts from increased access into remote areas include theft or inadvertent damage to fossils, and would be adverse and long-term. Operation-related impacts include theft or inadvertent damage to fossils by personnel, and would also be considered adverse and long-term. A beneficial effect common to all of these impact types is the discovery of fossils that are unknown, rare, or significant and would otherwise go undiscovered. However, personnel operating VCWEP facilities should be instructed to not collect or to disturb fossils.

No Action

As outlined above, a beneficial effect of the VCWEP would be the discovery of unknown, rare, or significant fossils, which may otherwise go undiscovered. The No Action Alternative reduces the opportunity for potential discovery and documentation of fossil resources in this part of Valley County. On the other hand, the No Action Alternative would indirectly protect paleontological resources by maintaining the relatively remote nature of the area and not increasing the potential for theft or inadvertent destruction of fossils.

Proposed Action

Wind Farm

Activities in the wind farm area that could potentially harm paleontological resources include: 1) ground disturbing activities, such as road construction and excavation into bedrock; 2) illegal collection and accidental disturbance of fossils as a result of increased public access to the wind farm area; and 3) theft or inadvertent damage to fossils by VCWEP personnel.

No previously recorded fossil localities are defined in the wind farm area. A pre-construction field inventory in areas where paleontological resources may be encountered, if requested by the agencies, would allow specific mitigation measures to be applied to avoid most direct, adverse, long-term impacts. The field survey would be carried out by a qualified paleontologist. It would be a pedestrian survey of the affected area and may include sampling or collection of diagnostic surface fossils. The paleontological inventory may also include an intuitive field examination of exposures of fossiliferous formations, looking for fossils, identifying the potential for significant fossils, making recommendations for monitoring during construction, and writing a technical report on survey results. The results of the survey would guide the development of a mitigation plan. Avoidance of sensitive paleontological resources could

be further ensured by delineation with flagging or fencing during construction. Instructing personnel on the laws that protect paleontological resources, the importance of leaving fossils in their original context, and what to do if a fossil is discovered would also reduce potential impacts.

Phase I

Geologic map units in Phase I include Kb (Bearpaw Shale), Tsg (Flaxville Formation) and Qsg (Quaternary Deposits). Unit Tsg is predominant and includes the Tertiary Flaxville Formation and possible Pleistocene Deposits. This unit caps the relatively flat, plateau-like landforms (benches) where the turbines would be erected. The Bearpaw Shale (Kb) underlies the Flaxville Formation (Tsg), and may be exposed on the flanks of the benches, in drainages, or other erosional areas. Unit Qsg (Quaternary Deposits) includes Pleistocene-Holocene terrace deposits, glacial outwash, and colluvium. These deposits occur in and adjacent to modern and former drainages, as well as on the flanks of the Flaxville Formation (Tsg)-capped benches. All three map units have a moderate paleontological resource sensitivity rating and would be subjected to a pre-construction paleontological field inventory, if required by the agencies. The inventory could result in development of specific mitigation measures.

Ground disturbing activities, such as road construction and excavation into bedrock, have the highest potential to disturb paleontological resources, and impacts could be direct, adverse, and long-term. However, application of mitigation measures would substantially decrease initial impact levels to lower residual impact levels. Mitigation measures would include: instruction of construction personnel on the importance and methods of protecting paleontological resources, a construction contract addressing Federal and State laws regarding fossils including collection and removal, and pre-construction field surveys. By conducting a pre-construction field inventory in areas where significant paleontological resources may be encountered and impacted, specific mitigation measures could be applied to avoid most direct, adverse, long-term impacts.

Adverse, long-term impacts from increased access into remote areas include theft or inadvertent damage to fossils. New roads would likely result in increased use of public lands in the VCWEP area, and it is possible that fossils would be illegally collected or accidentally disturbed as a result. Although public education efforts and signs might reduce the potential for theft, such efforts may also draw more attention to the resource. Thus, some adverse impacts to paleontological resources may be unavoidable. Inadvertent damage to fossils could occur with increased vehicle or foot traffic and would also be unavoidable.

Operation-related impacts include theft or inadvertent damage to fossils by VCWEP personnel, and would be considered adverse and long-term. Recommended mitigation includes providing employees with instruction on the laws that protect paleontological resources, an explanation of the importance of fossils in their original context, and a protocol for what to do if a fossil is discovered.

Phase II

Geologic map units in Phase II are the same as described for Phase I. All three map units have a moderate paleontological resource sensitivity rating and would be subjected to a pre-construction paleontological field inventory, if required by the agencies. The impacts and mitigation measures for Phase II would be the same as described above for Phase I.

Phase III

Geologic map units in Phase III are the same as described above for Phase I.

Phase IV

Geologic map units in Phase IV are the same as described above for Phase I.

Full Build-out

Geologic map units in the wind farm at full build-out include Kb (Bearpaw Shale), Tsg (Flaxville Formation) and Qsg (Quaternary Deposits). Conditions for full build-out are the same as described for Phase I. All three map units have a moderate paleontological resource sensitivity rating and would be subjected to a pre-construction paleontological field inventory, if required by the agencies.

Transmission Route C

Table 3.11-4 shows initial impact levels by relating paleontological resource sensitivity ratings to transmission line ground disturbance levels. Table 3.11-5 applies information in Table 3.11-4, and shows the initial impact level for each map unit in relation to ground disturbance levels.

Ground disturbance levels are:

Level 1 - Agricultural lands; no access needed.

Level 2 - Use existing improved roads; no improvements needed.

Level 3 - Use existing unimproved roads (two-track); may require blading or culvert installation in some areas.

Level 4 - New access road required in flat to gently sloping terrain (0-5 percent slopes).

Level 5 - New access roads required in sloping terrain (5-35 percent slopes).

Application of mitigation measures would substantially decrease initial impact levels to lower residual impact levels.

Table 3.11-4 Initial Impact Matrix for Transmission Routes A and C.

Paleontological Resource Sensitivity	Transmission Line Ground Disturbance and Access Assumptions				
	Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**
None	No Identifiable	No Identifiable	No Identifiable	No-Identifiable	No Identifiable
Low	No Identifiable	No-Identifiable	Low	Low	Low
Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
High	High	High	High	High	High

Table 3.11-5 Impact Levels and Map Unit Sensitivity

Geologic Map Unit (Resource Sensitivity)	Transmission Line Ground Disturbance and Access Assumptions				
	Level 1	Level 2	Level 3	Level 4	Level 5
Bearpaw Shale (Kb, Moderate)	Moderate	Moderate	Moderate	Moderate	Moderate
Judith River Formation (Kjr, High)	High	High	High	High	High
Flaxville Formation (Tsg, Tf, Moderate)	Moderate	Moderate	Moderate	Moderate	Moderate
Quaternary Deposits (Qsg, Qac, Qg, Moderate)	Moderate	Moderate	Moderate	Moderate	Moderate
Quaternary Alluvium (Qal, None)	No Identifiable	No Identifiable	No Identifiable	No Identifiable	No Identifiable

Impacts associated with Transmission Route C include ground disturbing activities, increased access into remote areas, and operation-related activities. A beneficial effect common to all of these impact types is the discovery of fossils, which would otherwise go undiscovered and are unknown, rare, or significant.

Ground disturbing activities, such as excavation into bedrock for transmission line structures and road construction, have the highest potential to disturb paleontological resources, and impacts could be direct, adverse, and long-term. By conducting a pre-construction field inventory in areas where significant paleontological resources may be encountered, specific mitigation measures could be applied to avoid most direct, adverse, long-term impacts. Adverse, long-term impacts from increased access into remote areas include theft or inadvertent damage to fossils. New roads would likely result in increased use of public lands along the transmission line, and it is possible that fossils could be illegally collected or accidentally disturbed as a result. Adverse, long-term, operation-related impacts to paleontological resources include theft or inadvertent damage to fossils by personnel.

Geologic map units along Transmission Route C include Kb (Bearpaw Shale); Tsg/Tf (Flaxville Formation); Qsg, Qac, and Qg (Quaternary Deposits); and Qal (Holocene alluvium). Unit Qal, Holocene alluvium, has a paleontological resource sensitivity rating of “none” and no identifiable impacts are projected. All of the other map units along Transmission Route C have a moderate paleontological resource sensitivity rating and would be subjected to a pre-construction paleontological inventory.

Antelope Creek Substation

The geologic map unit at the Antelope Creek Substation site is Qac (Quaternary Deposits), which has a moderate paleontological resource sensitivity rating. A significant break in slope mapped near the substation site may expose units Kb (Bearpaw Shale) or Qg (Quaternary Deposits), which have moderate paleontological resource sensitivity ratings, but the sloping ground would be avoided.

Impacts associated with the Antelope Creek Substation include construction-related activities. A beneficial effect common to both of these impact types is the discovery of fossils, which would otherwise go undiscovered and are unknown, rare, or significant.

Ground disturbing activities, such as blading and excavation, have the highest potential to disturb paleontological resources, and impacts could be direct, adverse, and long-term. However, application of mitigation measures would substantially decrease initial impact levels to lower residual impact levels.

Procedures for paleontological discovery with suspension of construction activity is included in Western's standard provisions (Appendix G).

The surface of the substation within the fenced area would be covered with approximately 6 inches of crushed rock. With the bed of crushed rock on the surface, there would be no operation-related impacts to fossils at the Antelope Creek Substation.

Alternative A

Wind Farm and Antelope Creek Substation

Under Alternative A, impacts associated with wind farm and substation construction, operation, maintenance, and decommissioning would be identical to those discussed for the Proposed Action.

Transmission Route A

The impacts and mitigation measures for Transmission Route A are the same as described above for Transmission Route C. Geologic map units along Route A include Kb (Bearpaw Shale); Tsg/Tf (Flaxville Formation); and Qsg, Qac, Qg, and Qal (Quaternary Deposits). With the exception of unit Qal, which is Holocene in age and too young to contain fossils in primary context, all of the map units have a moderate paleontological resource sensitivity rating and would be subjected to a pre-construction paleontological field inventory, if required by the agencies. and mitigation measures as discussed for the Proposed Action.

3.12 Cultural Resources

Cultural resources are districts, sites, buildings, structures, or objects considered to be important to a culture, subculture, or community for scientific, traditional, religious or other reasons. For this EA, cultural resources have been divided into four major categories: archaeological resources, the built environment, traditional cultural properties, and cultural landscapes. Archaeological resources are locations where human activity has measurably altered the earth or left deposits of physical remains (e.g., tipi rings, stone tools, house foundations, bottles, cans). The built environment includes standing buildings (e.g., houses, barns, outbuildings, schools, churches) or intact structures (e.g., dams, canals, bridges). Traditional cultural properties (TCPs) are resources that are important to a community's traditional practices and beliefs and for maintaining the community's cultural identity (Parker and King 1998). A cultural landscape is defined as a geographic area, including both cultural and natural resources, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values (Birnbaum 1994).

Several laws require that information about cultural resources be kept confidential to protect them from vandalism. For this reason, this section offers only limited descriptions of the characteristics and locations of cultural resources in the VCWEP area. In addition, no information on TCPs will be shared with the public without permission from those providing the information.

Federal and State laws protect cultural resources or require their consideration in assessing the effects of a proposed undertaking. An undertaking is equivalent to the Proposed Action or alternative discussed in this EA. The most relevant Federal historic preservation laws for the VCWEP are the National Historic Preservation Act of 1966 (NHPA) and the Archaeological Resources Protection Act of 1979 (ARPA). The identification and protection of cultural resources on State lands are performed according to DNRC guidance implementing the Montana Antiquities Act.

Section 106 of the NHPA and its implementing regulations (36 CFR 800) outline procedures for considering the effects of proposed Federal undertakings on cultural resources. Procedures are outlined for identifying resources, evaluating their significance, assessing effects, implementing measures to

mitigate adverse effects, and consulting with Native American groups and other interested parties. These procedures are developed in more detail in a Programmatic Agreement, discussed below.

ARPA (16 U.S.C 470 aa-mm) protects archaeological resources on Federal and tribal land.

With regard to the VCWEP, cultural resource surveys on BLM-administered lands were performed under the provisions of a Cultural Resource Use Permit (CRUP) issued by the BLM under the Federal Land Policy and Management Act (FLPMA) (P.L. 94-579).

The Native American Graves Protection and Repatriation Act (NAGPRA) (P.L. 101-601) regulates the ownership and control of Native American human remains and cultural items that are discovered on Federal or tribal land.

As required by Section 106, Western, BLM, FSA, DNRC, DEQ, Montana State Historic Preservation Office (SHPO), various tribes, and Wind Hunter are in the process of developing a Programmatic Agreement that would identify procedures and guidelines for the identification, evaluation, and treatment of cultural resources in the VCWEP area. Procedures would be spelled out in more detail in a Historic Properties Treatment Plan (HPTP). BLM and DNRC have responsibilities for protecting cultural resources on their respective lands. FSA is responsible for Section 106 compliance on private lands for which they have made loans. Western has the lead for the proposed interconnection with the Fort Peck-to-Havre transmission line. DEQ has responsibilities under both MEPA and MFSA. Section 1.4 of the DEQ Environmental Specifications (Appendix E) requires implementation of a plan, approved by the SHPO, for identifying, evaluating, and avoiding or mitigating impacts to cultural resources. The Programmatic Agreement, when signed by DEQ and the SHPO, should serve this purpose. The Montana SHPO has a critical role in consulting on Section 106 compliance. Section 106 also requires that Montana tribes be offered the opportunity to participate.

3.12.1 Affected Environment

Data on cultural resources in the project area were compiled from several sources:

- The Cultural Resource Annotated Bibliography System (CRABS) of the Montana SHPO at the Montana Historical Society (MHS).
- The Cultural Resource Information System (CRIS) database of the Montana SHPO.
- MHS cultural resource inventory forms housed at the Department of Anthropology, University of Montana, Missoula.
- Cultural resource inventory reports on file at the MHS office in Helena.
- Documents in the collections of the Valley County Pioneer Museum in Glasgow.
- The National Register Information System (NRIS) of the National Register of Historic Places (NRHP).
- The National Historic Landmarks Survey of the National Park Service (NPS).
- Data supplied by BLM and DNRC staff archaeologists.
- A brief vehicle and aerial reconnaissance of the study area performed in May 2005.
- An intensive Class III cultural resource survey in August 2005 of portions of the wind farm, portions of Transmission Routes A and C, and the location of Antelope Creek Substation. All of the Phase I portion of the wind farm has been surveyed.

- Initial efforts to consult with representatives of interested Native American groups in Montana, including a visit to the project area with tribal representatives in September 2005, and a tribal consultation meeting held in Great Falls in December 2005. Also, a tribal member participated in the cultural resource field survey in August 2005.

Prior to 2005, most cultural resource investigations in the study area had limited coverage. There have been many small (less than 10 acres) cultural resource surveys, most of them related to impoundments and other improvements on BLM land. Several larger inventories, sometimes covering hundreds of acres, have been conducted for major chisel plowing projects on BLM land (Julien 1989, 1993, 1998); on proposed National Guard training areas (Deaver and Aaberg 1977); and along linear corridors for roads, transmission lines, pipelines, and fiber optic lines (Archeological Services 1979; Brumley 1989; Dau 1993; Dau and Rennie 1993; Fredlund et al. 1986; GCM 1996; Greiser et al. 1985; Herbort and Munson 1986; Thompson 1996; Wirth Associates 1984). There have also been a few non-systematic, non-intensive cultural resource inventories (e.g., Queen 1991). Table 3.12-1 summarizes the amount of land in various portions of the VCWEP that had been surveyed for cultural resources as of December 2005, including the results of the intensive survey performed in August 2005.

Table 3.12-1 VCWEP Cultural Resources and Surveyed Acreage as of December 2005

VCWEP Component	Total Acreage	Acreage Surveyed for Cultural Resources		Recorded Cultural Resources
		Acres	Percent	
Wind Farm				
Phase I	1,094	1,094	100.0%	11
Phase II	2,800	155	5.5%	2
Phase III	5,520	171	3.1%	7
Phase IV	10,706	483	4.5%	7
Full Build-out	20,120	1,903	9.5%	27
Transmission Routes				
A	534[1]	50	9.4%	2
C	435[2]	42	9.7%	2
Antelope Creek Substation	5	5	100.0%	0

[1]Route A right-of-way would be 41.5 miles long and 80 to 110 feet wide.
[2]Route C right-of-way would be 34.1 miles long and 80 to 110 feet wide.

Overall, less than 10 percent of the land within the boundaries of the proposed wind farm, alternative transmission routes, and substation has been surveyed by archaeologists using current BLM, Western, DNRC, and Montana SHPO standards. It is likely, therefore, that only a small percentage of the cultural resources in the project area have been identified. Nonetheless, it is still possible to describe the range of cultural resources that exist in the VCWEP area. Previously identified archaeological resources include rock cairns, rock piles, rock alignments, tipi rings, surface scatters of stone tools and flakes, 19th and 20th century trash dumps, homestead remains, and building foundations. The documented built environment includes houses, canals, a railroad grade, and bridges. One potential cultural landscape was identified in 2005. No information is available on TCPs.

The NRIS of the NRHP was examined on March 31, 2006. According to the NRIS, there are 11 NRHP-listed properties in Valley County. All are located outside the study area. The NPS lists 23 National Historic Landmarks in Montana. None of these is located in Valley County.

Native Americans have lived in the Northwestern Plains for at least 12,000 years. Small nomadic groups of Native Americans hunted mammoths, the focus of their economy. Later Native American groups emphasized bison hunting, although archaeological sites in the Northwestern Plains also include the bones of deer, coyote, antelope, rabbit, squirrel, and catfish as well as charred plant remains. Pottery was first used in Montana around 1,800 years ago. Beginning about A.D. 500 there was dramatic change in the Native American cultures of the Northwestern Plains as populations of hunter-gatherers and farmers moved into the region from surrounding areas. Pottery became much more widely used, the bow and arrow became the principal hunting tool, and the presence of bison scapula hoes suggests the beginnings of agriculture. Around A.D. 1720, the horse was introduced to the Northwestern Plains, which led to major changes in Native American subsistence, demography, social organization, and settlement patterns.

Euro-Americans first entered northeastern Montana around 250 years ago, and it is possible that a French fur-exploring party entered the Valley County area as early as 1743. Between 1820 and 1840, there was an influx into the region of trappers, traders, and missionaries. The earliest trading post in the Valley County area was reportedly along the Milk River near Vandalia. Initially, the Missouri River was the principal corridor through Montana, and trade between Euro-Americans and Native Americans did not usually extend much beyond that corridor.

Use of the region by Euro-Americans increased after the Stevens Treaty of 1855, which created a large Indian Reserve occupied by several tribes. With the end of the great bison herds by 1885, cattlemen looked toward the grazing opportunities in the Indian Reserve lands north of the Missouri River. In 1885, the large Indian Reserve created in 1855 was broken up and the boundaries of the modern Fort Peck Reservation were outlined. The land outside the reservation was opened up to general settlement in 1887, and raising livestock was the main economic activity until 1910.

In 1884, when Montana gained territorial status, the entire region was part of Big Horn County. By 1893, the county had been split several times, creating Valley County. The town of Glasgow was platted in 1887, and in 1893 Glasgow became the seat of Valley County.

Between 1900 and 1910 several major irrigation projects were begun in the area to encourage more homesteading. These included the Milk River Project, the Fort Peck Irrigation Project, the Vandalia South Canal, and the Rock Creek Canal. With improved irrigation and transportation, population in Valley County increased during the early 20th century. However, a drought from 1917 to 1919 forced many homesteaders to leave, and the Great Depression and another drought in the 1930s ended homesteading altogether. Two major economic developments in the Glasgow area were the construction of Fort Peck Dam between 1933 and 1938 and the operation of Glasgow Air Force Base between 1957 and 1968.

3.12.2 Environmental Consequences

Introduction

Cultural resources are protected by Federal and State laws if they are found to have some level of significance under the criteria of the NRHP or under State guidance. Most of the cultural resources previously recorded in the VCWEP area have never been evaluated for NRHP eligibility. The evaluation of these resources and the disposition of those determined eligible to the NRHP would follow procedures and guidelines presented in the Section 106 Programmatic Agreement. Therefore, for this EA, a cultural resource is assumed to be eligible for the NRHP pending a determination, unless: 1) the resource consists of a single, isolated artifact; 2) the resource is unquestionably substantially disturbed by agriculture, erosion, or other processes; or 3) the resource is less than 50 years old.

An undertaking results in adverse effects, or impacts, to a cultural resource eligible to the NRHP when it alters the resource's characteristics, including relevant features of its environment or use, that qualify it for inclusion in the NRHP. Potential impacts could include:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property from, or alteration of the character of the property's setting when that character contributes to the property's qualification to the NRHP;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- Neglect of a property resulting in its deterioration or destruction; and
- Transfer, lease, or sale of the property.

An assessment of effects under Section 106 requires the identification of the Area of Potential Effects (APE). An APE is the area within which cultural resources could be physically, visually, or audibly affected, or impacted, by the proposed undertaking. Direct impacts that could occur as a result of the VCWEP include ground disturbance and visual impacts. Ground disturbance could result from construction, operation, maintenance or decommissioning of the wind farm, transmission line, and substation. Because archaeological resources are non-renewable, both temporary and permanent ground disturbance can cause irreparable damage to the resource. Visual impacts could result from the presence of wind turbines or transmission structures and poles near a cultural resource for which visual setting is a major consideration in its NRHP eligibility or importance as a TCP. Under the provisions of the draft Programmatic Agreement, visual impacts would be considered for cultural resources within 1.0 mile of the centerline of the alternative transmission routes, and within 2.5 miles of the boundaries of the proposed wind farm. Indirect impacts to cultural resources could be caused by increased vandalism or unintentional ground disturbance (e.g., OHV use) caused by improved access (e.g., workers, recreational visitors).

No Action

The No Action Alternative would result in no impacts to cultural resources related to VCWEP development.

Proposed Action

This section identifies the numbers and types of cultural resources that could be adversely affected by the Proposed Action. As shown in Table 3.12-1, most the VCWEP area has not been surveyed for cultural resources. The locations of wind turbines, roads, and other facilities shown in Figure 2.3-1 are conceptual; potential ground disturbance impacts on specific cultural resources cannot be determined until later in the design process. Site-specific impacts would be identified before a POD is issued by the BLM and DNRC and lease agreement made with the DNRC, and would also be addressed in the HPTP per the Programmatic Agreement. Avoidance would be the preferred option for the protection of NRHP-eligible cultural resources. If avoidance is not feasible, other measures, including data recovery, may mitigate impacts.

As mentioned above, tribal consultation efforts have not yet produced information regarding TCPs in the VCWEP area. Tribal consultation is an ongoing process that would continue.

Visual impacts on cultural resources would be evaluated in consultation with the parties to the Programmatic Agreement. Initial consultation efforts with several tribes have not yet identified specific concerns regarding visual impacts of the proposed wind farm on cultural resources. Documentation of visually sensitive cultural resources (e.g., TCPs, some buildings, cultural landscapes) within 2.5 miles of the proposed wind farm and within 1.0 mile of the transmission route centerline would occur in prior to construction as part of Section 106 compliance.

While it is possible that improved access to the VCWEP area could have an indirect impact on cultural resources by leading to an increase in vandalism and unintentional damage, the specific locations and levels of disturbance are impossible to estimate. These potential impacts can be reduced by educating wind farm workers about the importance of not disturbing cultural resources, and implementing other measures to be outlined in the HPTP.

Wind Farm

Phase I

The Phase I area of the proposed wind farm has been surveyed in its entirety (100 percent of 1,094 acres) by archaeologists and contains 11 archaeological sites (Table 3.12-1). Determinations of NRHP eligibility have not yet been made, but will be completed as required by the Programmatic Agreement. Most have one or two stone circles (tipi rings) or low-density surface scatters of Native American or Euro-American artifacts. One archaeological site has 17 tipi rings. No buildings or structures and no potential cultural landscapes were identified during the field investigations in the Phase I area.

Only a small portion of the Phase I area (84.7 acres, or about 8 percent) (see Table 2.2-2) would be temporarily or permanently disturbed during construction and operation. It is anticipated that most, if not all, of the cultural resources can be avoided and that there would be few direct impacts caused by ground disturbance. Visual Impacts would be assessed and, if necessary, mitigated under the provisions of the Programmatic Agreement.

Investigations to document visually sensitive cultural resources within 2.5 miles of the wind farm boundaries have not yet occurred, so potential visual impacts on cultural resources have not been determined.

Phase II

Only 5.5 percent (155 out of 2,800 acres) of the Phase II area has been surveyed for cultural resources, and only two cultural resources have been recorded – a prehistoric archaeological site and a historic cow camp with a small cabin. No potential cultural landscapes were identified in the limited area surveyed. The terrain and ecological setting in the Phase II area is generally similar to that of the Phase I area, so it is anticipated that a similar density of cultural resources may occur there (i.e., about one cultural resource for every 100 acres).

Only a small portion of the Phase II area (115.0 acres, or about 4 percent) (see Table 2.2-2) would be temporarily or permanently disturbed during construction and operation. It is anticipated that most, if not all, of the cultural resources can be avoided and that there would be few direct impacts caused by ground disturbance.

Investigations to document visually sensitive cultural resources within 2.5 miles of the wind farm boundaries have not yet occurred. Potential visual impacts on cultural resources have not been determined.

Phase III

Only 3.1 percent (171 out of 5,520 acres) of the Phase III area has been surveyed for cultural resources, and only seven cultural resources have been recorded – one large prehistoric site with tipi rings and cairns, three smaller prehistoric artifact scatters, one scatter of historic debris, and two homestead foundations. No buildings or structures have been identified, and no potential cultural landscapes were identified in the limited area surveyed. The terrain and ecological setting in the Phase III area is generally similar to that of the Phase I area, so it is anticipated that a similar density of cultural resources may occur there (i.e., about one cultural resource for every 100 acres).

Only a small portion of the Phase III area (202 acres, or about 4 percent) (see Table 2.2-2) would be temporarily or permanently disturbed during construction and operation. It is anticipated that most, if not all, of the cultural resources can be avoided and that there would be few direct impacts caused by ground disturbance.

Investigations to document visually sensitive cultural resources within 2.5 miles of the wind farm boundaries have not yet occurred. Potential visual impacts on cultural resources have not been determined.

Phase IV

Only 4.5 percent (483 out of 10,706 acres) of the Phase IV area has been surveyed for cultural resources, and only seven cultural resources have been recorded – a log house with outbuildings and several archeological sites with stone flakes and tipi rings. No potential cultural landscapes were identified in the limited area surveyed. The terrain and ecological setting in the Phase IV area is generally similar to that of the Phase I area, so it is anticipated that a similar density of cultural resources may occur there (i.e., about one cultural resource for every 100 acres).

Only a small portion of the Phase IV area (325 acres, or about 3 percent) (see Table 2.2-2) would be temporarily or permanently disturbed during construction and operation. It is anticipated that most, if not all, of the cultural resources can be avoided and that there would be few direct impacts caused by ground disturbance.

Investigations to document visually sensitive cultural resources within 2.5 miles of the wind farm boundaries have not yet occurred. Potential visual impacts on cultural resources have not been determined.

Full Build-out

Only 9.5 percent (1,903 out of 20,120 acres) of the entire wind farm area has been surveyed for cultural resources. Outside of the Phase I area, only 4.3 percent (809 acres) has been surveyed. A total of 27 cultural resources have been recorded – including buildings and archaeological sites. No potential cultural landscapes have been identified in the limited area surveyed. Based on the similarities of terrain and ecological setting it is anticipated that the density of cultural resources may be around one cultural resource for every 100 acres, but this estimate is problematic given the very limited amount of survey in most of the wind farm area.

Only a small portion of the wind farm area (727 acres, or less than 4 percent) (see Table 2.2-2) would be temporarily or permanently disturbed during construction and operation. It is anticipated that most, if not all, of the cultural resources can be avoided and that there would be few direct impacts caused by ground disturbance.

Investigations to document visually sensitive cultural resources within 2.5 miles of the wind farm boundaries have not yet occurred. Potential visual impacts on cultural resources have not been determined. As mentioned previously, initial consultation efforts with several tribes have not yet identified specific concerns regarding visual impacts of the wind turbines on cultural resources.

Transmission Route C

Little of the Transmission Route C right-of-way (42 out of 435 acres, or roughly 10 percent) has been surveyed for cultural resources, and only two resources have been recorded: the Vandalia South Canal and the Burlington Northern Santa Fe (BNSF) (formerly Great Northern) Railroad. Both have been determined eligible for the NRHP. The transmission line would span the canal and railroad, resulting in no impacts to these cultural resources. In 2005 a potential cultural landscape dating to the homestead period of the early 20th century was identified in the proposed right-of-way. Further documentation and

agency consultation are necessary to determine the boundaries of this resource, its NRHP eligibility, potential impacts, and appropriate measures to mitigate impacts, if any. These activities, as well as additional inventory within the APE, resource evaluation, and mitigation, would be performed as required by the Section 106 Programmatic Agreement.

The right-of-way for Transmission Route C would be surveyed for cultural resources before construction and NRHP-eligible resources would be avoided by design, if possible. For Transmission Route C, 146 acres out of 435 acres (33 percent) within the right-of-way would be temporarily or permanently disturbed along the 34.1-mile corridor (see Table 2.2-7). Approximately 125 acres of this disturbance would occur on previously cultivated land where cultural resources are probably already damaged (see Table 3.7-11). If avoidance is not feasible, other measures, including data recovery, may mitigate impacts. It should be noted that investigations to document visually sensitive cultural resources within 1.0 mile of the centerline of Route C have not yet occurred, so potential visual impacts of the transmission line on cultural resources have not been determined.

Antelope Creek Substation

In 2005 an intensive and systematic cultural resource survey was performed at the location of the proposed Antelope Creek Substation. No cultural resources were identified, and no visually sensitive cultural resources are known to occur in the vicinity of the proposed substation. Further consultation with Native Americans would be necessary to determine whether they have concerns about TCPs and other cultural resources near the proposed substation. It is anticipated that no impacts to cultural resources would occur at this location.

Alternative A

Wind Farm and Antelope Creek Substation

Under Alternative A, impacts from the development of the proposed wind farm and Antelope Creek Substation would be identical to those described for the Proposed Action.

Transmission Route A

Little of the Transmission Route A right-of-way (50 out of 534 acres, or roughly 10 percent) has been surveyed for cultural resources, and only two resources have been recorded: the Vandalia South Canal and the BNSF (formerly Great Northern) Railroad. These resources are discussed under Transmission Route C.

The right-of-way for Transmission Route A would be surveyed for cultural resources before construction, and NRHP-eligible resources would be avoided by design, if possible. For Transmission Route A, 197 acres out of 534 acres (37 percent) within the right-of-way would be temporarily or permanently disturbed along the 40.5-mile corridor (see Table 2.2-7). Approximately 165 acres of this disturbance would occur on previously cultivated land where cultural resources are probably already damaged (see Table 3.7-11). If avoidance is not feasible, other measures, including data recovery, may mitigate impacts.

Investigations to document visually sensitive cultural resources within 1.0 mile of the centerline of Route A have not yet occurred. Potential visual impacts on cultural resources have not been determined

3.13 Health and Safety

3.13.1 Affected Environment

There are few existing hazards at the VCWEP site. Fire is the primary existing health and safety risk, because much of the VCWEP area is arid rangeland with a predominant groundcover of grasses. Under existing conditions, fires can be started by lightning strike or human carelessness.

3.13.2 Environmental Consequences

No Action

Under the No Action Alternative, potential risks to health and safety in the VCWEP area, mainly the risk of fire, would stay the same as they are today.

Proposed Action

Wind Farm

Potential risks to health and safety associated with the construction, operation and maintenance of all four phases of the wind farm and the measures implemented to reduce the risks are summarized in Table 3.13-1. With these design and safety measures, impacts would be low.

The BLM's Wind Energy Development PEIS (BLM 2005) also identifies public safety hazards during construction, operation and maintenance of a wind energy development project. These hazards include risks associated with major construction sites, rare tower failures, human-caused fire, electromagnetic field (EMF) exposure, electromagnetic interference (EMI), aviation safety interference, low frequency sound and shadow flicker. The PEIS identifies planning and operating measures that have been successfully implemented in other wind farm projects to reduce or avoid public safety risks. These measures would be applicable to the VCWEP.

Wind farms can potentially interfere with radio, television and microwave transmissions in several ways:

- A wind turbine may obstruct, reflect or refract the electromagnetic waves used in a range of communication systems;
- The rotating blades may have similar effects; and
- The generator itself can produce electromagnetic interference, although in the case of modern wind turbine design this type of interference is rare because it can be suppressed by shielding and good maintenance of the turbines.

Radio, television, and microwave transmission from towers located within 1,000 to 2,000 feet (305 to 610 meters) of one or more wind turbines could potentially be affected by the wind turbine towers or blades. Such effects are very uncommon with today's wind technology because there is little or no metal within the moving blades that could cause interference.

Communications systems most likely to be affected are those that operate at very high frequencies, particularly microwave systems operating at frequencies above 300 MHz. These rely on line of sight between transmitter and receiver. Any obstruction in the vicinity of a straight line between these two points may cause interference and signal degradation. The three types of degradation methods are:

1. Near field effects (i.e., nearby electromagnetic interference)
2. Diffraction (i.e., signal distortion)
3. Reflection or scattering

Microwave transmission can be mitigated through minor shifts in tower location. There are also simple, straightforward, and cost-effective mitigation measures for the other effects of wind turbines on radio, TV, or other telecommunications functions (e.g., changing the microwave transmission pattern).

Table 3.13-1 Potential Risks to Human Health and Safety

Potential Risk	Measures to Reduce Risk
Increased risk of fire as a result of welding and other human activities.	Implementation of a Fire and Explosion Risk Mitigation Plan.
Blasting and accidental explosions from electrical collector system.	Implementation of a Fire and Explosion Risk Mitigation Plan. The majority of the proposed collector system would be buried underground, although a small portion could be constructed as overhead cables.
Accidental leakage or spillage of fuel (diesel, gasoline), mineral oil, hydraulic fluid, and lubricating oils.	Generally, only small quantities would be used or stored. Design features would be built into the VCWEP to reduce risk. Implementation of appropriate spill prevention and control measures.
Increased potential for lightning-induced fires because of tall structures.	Wind turbine generators, other mechanical equipment at the substation, meteorological towers, and transmission towers equipped with lightning protection systems.
Generation of hazardous waste.	Project operations would not result in the generation of regulated quantities of hazardous wastes.
Transport of hazardous materials (lubricating and mineral oils, cleaners, pesticides, industrial materials) to and from site.	Transport of hazardous materials will be in accordance with Federal and MDOT requirements (see Section 3.3).
Ice thrown from blades.	While more than 55,000 wind turbine generators have been installed worldwide, there has been no reported injury from ice thrown from wind turbines. VCWEP turbines would be constructed with a cold weather package to avoid icing.
Falling debris.	Minimum setbacks incorporated into the VCWEP layout and compliance with design and safety standards.
Tall structures located near cultivated fields during crop dusting.	Transmission lines have been sited to avoid cultivated land where practical. On-the-ground pesticide spraying may be necessary near some transmission line structures and segments.

Transmission Route C

The transmission line would be designed to comply with the NESC, DOL Occupational Safety and Health Standards, and recognized requirements for safety and protection of workers, landowners, other individuals, and property.

In addition to the potential risks and measures to reduce risk presented in Table 3.13-1, an issue was raised during EA scoping meetings regarding the potential for interference with metallic telephone lines primarily from transmission line operation and possibly from wind turbine operation and 34.5kV feeder lines.

Possible power line AC interference effects from the transmission line and feeder lines are based on two scenarios: 1) normal operation of the line can produce inductive coupling that may interfere with communication lines and cause safety issues; and 2) fault conditions can produce inductive and coupling interference that may produce safety and possible equipment damage issues.

Industry guidelines for protection of telecommunication facilities are primarily presented in two Institute of Electrical and Electronic Engineer (IEEE) standards: 1) IEEE Std 367-1996(R2002), "Recommended Practice for Determining the Electric Power Station Ground Potential Rise and Induced Voltage from a Power Fault"; and 2) IEEE Std 487-2000, "Recommended Practice for the Protection of Wire-Line Communication Facilities Serving Electric Supply Locations."

The primary areas that should be addressed for power line interference of telecommunication facilities are:

- Telecommunication Worker Safety
- Equipment Protection
- Cable Insulation

The types of mitigation required to reduce interference effects below industry guidelines are:

- If a telecommunication cable or equipment access point is a buried joint or above-ground joint, this could be converted to a buried, non-accessible joint and labeled accordingly.
- If the high ground potential due to a fault exceeds the cable insulation rating of the section of cable inside the ground potential rise (GPR) zone of influence, the cable should be replaced with a higher voltage insulation level or re-routed.
- Nearby telecommunication equipment housing may require isolation units to isolate the incoming cables.
- Installation of a bare, buried conductor in close proximity to the communication cable.
- Installation of isolation points in the communication cables.
- Installation of fiber optic cable sections in the communication circuit.
- Installation of isolation units in communications circuits that are connected to houses and buildings.

With implementation of appropriate safety plans and design standards, impacts to health and safety would be rare. Magnetic induction effects would be effectively reduced or eliminated through measures to reduce impacts such as appropriate grounding practices and maintenance of ground-to-wire clearances. The 161/230kV transmission line would be designed and constructed in accordance with NESC requirements, which provide for minimum allowable distances between the lines and the ground or other objects, and from the lines to the edge of the right-of-way. The State of Montana has electric field strength standards of 7kV/m maximum at highway crossings and 1kV/m at the edge of the right-of-way, which may be waived by the landowner. The purpose of the 7kV/m standard at highway crossings is to ensure that electric current induced into large metal objects such as trucks and buses does not represent an electric shock hazard. The electric field strength at the edge of the right-of-way for the portion of the 161/230kV transmission line that would use wood pole H-Frame structures is 0.8kV/m and is 0.9kV/m for the portion of the line that would use light duty steel single poles (Table 2.3-7). For both configurations, the electric field strength is below the 1kV/m Montana standard. The maximum magnetic

field strength at the edge of right-of-way for the portion of the line using either H-frame structures is 65 milliGauss (mG) and for single poles is 57 mG. Within the right-of-way, the maximum field strength is 306 mG for H-frame structures and 188 mG for single poles (Table 2.3-7). The State of Montana does not have standards for maximum magnetic field strength near transmission lines.

According to two recent studies (Li et al. 2002; Neutra et al. 2002), there may be a link between exposure to magnetic fields and miscarriages. The studies found an increased risk of miscarriage among California women who were exposed to high peak magnetic fields (maximum exposure above 16 mG during the measurement day) in early pregnancy. Maximum magnetic field strength from the proposed transmission line would be 306 mG for H-frame structures and 188 mG for single poles. According to three of the researches (Neutra et al. 2002), ". . . since the majority of people come into contact with non-obvious sources of magnetic fields on a daily basis, it may not be possible to avoid the majority of such exposures in modern life, even if we avoided the obvious sources like some appliances. Seventy-five percent of the women in the studies had at least one of these brief high exposures during a given day. Even one exposure a day, if experienced regularly during pregnancy, seemed to increase the risk of miscarriage. Nonetheless, the majority of women with such exposures did NOT miscarry." It should be noted that in the report by Neutra et al. (2002), there was a considerable amount of uncertainty over the relationship between miscarriage and magnetic field exposure.

Except for road crossings, Transmission Route C would be located in an area where there are no sensitive receptors for electric and magnetic fields and electric and magnetic induction.

Antelope Creek Substation

With implementation of appropriate safety plans and design standards, impacts to heath and safety would be low. Substation transformers would have a specifically designed containment system to ensure that any accidental fluid leak does not result in discharge to the environment.

Alternative A

Under Alternative A, impacts associated with wind farm, substation, and Route A transmission line construction, operation, maintenance, and decommissioning, would be identical to those discussed for the Proposed Action.

3.14 Noise

3.14.1 Affected Environment

Noise is defined as unwanted sound. The unit used to describe the intensity of sound is the decibel (dB). The A-weight scale, or dB(A), approximates the range of human hearing by filtering out low frequency noises.

For a rural environment, background noise is typically about 40 dB(A) during the day and 30 dB(A) at night (BLM 2005). As a comparison, conversational speech is about 60 dB(A), and jet aircraft taking off can reach 120 dB(A). No background noise measurements have been made in the VCWEP area, but measurements from other locations suggest that the background noise levels in the wind farm area could be 38 to 48 dB(A). Noise levels generated by farm machinery, wildlife, and the wind can reach 55 dB(A). The most notable noise source in the vicinity of the proposed wind farm is the existing Northern Border Pipeline compressor station.

Noise sources near the alternative transmission routes are more varied and include farm machinery; traffic on U.S. Highway 2, State Highway 24, and other roads; the BNSF Railroad between Glasgow and Vandalia; Glasgow International Airport; and the Boeing facility at the former Glasgow Air Force Base.

There are no noise sensitive receptors (e.g., residences, schools, hospitals, offices) within 5 miles of the proposed wind farm area, but residences are located within 0.25 mile of the alternative transmission line routes and within 0.5 mile of the proposed substation (Section 3.4, Visual Resources). Section 3.2 Land Use discusses the noise environment in the vicinity of the Bitter Creek WSA.

3.14.2 Environmental Consequences

Introduction

There are no Federal noise standards that directly regulate noise from the operation of wind turbines, transmission lines, or substations. However, to protect public health and welfare, the EPA has developed guidelines on recommended maximum noise levels, and the Occupational Safety and Health Administration (OSHA) has established regulations to safeguard the hearing of workers. There are no local regulations or ordinances for noise in Valley County. EPA guidelines recommend a day-night average sound level (L_{dn}) of 55 dB(A) in typically quiet outdoor and residential areas. For protection against hearing loss, the EPA guidelines recommend a sound pressure level less than 70 dB(A) over a 24-hour period. However, these levels are recommendations, not requirements.

A 3-dB increase in noise is considered barely noticeable to humans, a 5-dB increase would typically result in a noticeable community response, and a 10-dB increase is considered a doubling of the sound level. The BLM's Wind Energy Development PEIS (BLM 2005) notes that on BLM-administered lands, large fluctuations in noise are common.

No Action

Under the No Action Alternative, natural background noise levels would continue as the wind farm and other facilities would not be built.

Proposed Action

Wind Farm

According to the Wind Energy Development PEIS (BLM 2005), noise levels associated with construction of a wind farm would vary greatly depending on the type of equipment, operation schedule, and condition of the area being worked. Construction would involve the use of similar equipment during all four phases of wind farm development, so it is assumed that potential noise impacts would also be similar. Noise levels for typical construction equipment are shown in Table 3.14-1.

Table 3.14-1 Noise Levels at Various Distances from Construction Noise Sources.

Construction Equipment	Noise Level ($L_{eq(1-h)}$[a]) [dB(A)]					
	50 ft	250 ft	500 ft	1000 ft	2500 ft	5000 ft
Bulldozer	85	71	65	59	51	45
Crane, derrick	88	74	68	62	54	48
Front-end loader	85	71	65	59	51	45
Generator	81	67	61	55	47	41
Grader	85	71	65	59	51	45
Truck	88	74	68	62	54	48

Source: HMMH(1995) in BLM (2005)
[a] $L_{eq(1-h)}$ is the equivalent steady-state sound level that contains the same varying sound level during a one-hour period.

For on-road construction vehicles (e.g., heavy trucks operating at 50 miles per hour), the PEIS (BLM 2005) estimates a peak noise level of 83 dB(A). However, noise levels for hourly traffic would generally be below the EPA guidelines of 55 dB(A) except in close proximity to the road or whenever there is heavy traffic volume.

Construction noise could temporarily disturb or displace individual birds, and potentially interfere with foraging, breeding, and nesting. Disturbance would be limited to the duration of construction activities. Project phasing would allow individual birds to move into undisturbed portions of the wind farm and adjacent grasslands during construction, and return to the area upon completion of construction. Construction-related disturbance would be limited to a single breeding/nesting season for each phase of the wind farm. Temporary disturbance from noise is not expected to result in reduced survival and reproductive success, and would result in a small adverse impact to grassland birds and raptors (see Section 3.7).

Construction at the wind farm would occur in six-to-eight-month periods; construction activities would be intermittent; construction would occur during normal day-time working hours; and construction noise would be within acceptable OSHA standards. Also, based on the typical attenuation of sound over distance (6 dBA per doubling of distance from the noise source), construction noise would be reduced to acceptable levels between 1,000 and 2,500 feet from the construction equipment (Table 3.14-1). Therefore, construction-related noise would not have a long-term impact on humans or wildlife. Section 3.2 Land Use discusses the potential impacts of construction on the Bitter Creek WSA.

During operations, major noise sources at a wind farm would include mechanical and aerodynamic noise. The PEIS (BLM 2005) offers some detail on the noise generated by wind turbines. Operation of the wind farm would not expose persons to noise levels in excess of EPA recommendations. Table 3.14-2 summarizes the predominant noise sources associated with a wind turbines. Whether turbine noise is intrusive or not would depend not only on its distribution of amplitude and frequency but also on the background noise, which would vary with the level of human and animal activity, wind speed, and other meteorological conditions. In general, wind-generated background noise tends to increase more rapidly with wind speed than aerodynamic noise from wind turbines. If noise from wind were to increase more than 6 dBA, the wind turbines would no longer contribute to a perceptible increase of noise. At 0.5 mile from a wind turbine in a direction downstream from the wind direction, the sound pressure level is estimated to be approximately 45 dB(A), equivalent to background noise levels in a rural environment. There are no sensitive receptors within 0.5 mile of the proposed wind farm at full build-out. Section 3.2 Land Use discusses the impacts of wind turbine noise on the Bitter Creek WSA. The most notable noise source in the vicinity of the proposed wind farm area would probably continue to be the existing Northern Border Pipeline compressor station and farm equipment operating in fields in the wind farm area.

Table 3.14-2 Wind Farm Noise Sources

Source	Typical dB(A) at 100 Feet
Wind Turbine	104
Transformers	75
Nacelle HVAC/Ventilation (inlet filter house)	61

Source: Edison Electric Institute, 1984

Transmission Route C

Noise levels during construction of the transmission line are expected to be from 54 to 84 dB(A), due to construction vehicles and machinery (Table 3.14-1). Construction-related noise would attenuate

significantly with distance from the construction site and would also be short-term in any specific location.

Radio interference (RI) and television interference (TVI) collectively referred to as Radio Noise, or RN is a phenomenon produced by both corona and sparking and can vary greatly based on weather conditions. Corona occurs when the electrical field at a particular point reaches a sufficiently high value to cause ionization of the surrounding air.

Corona is primarily a concern during bad weather because it is more likely to occur when water droplets are on or dripping off transmission line conductors. The effect of corona on RN is most evident in the AM broadcast band of 0.535 to 1.605 MHz. Generally, only broadcast signals in weak signal areas show interference due to coronal activity during foul weather. Cable and satellite systems are not susceptible to corona. Properly designed transmission lines greatly reduce the effects of corona. In addition, corona is primarily a concern for transmission lines operating at 345kV and higher. For the Proposed Action, the line would be configured at 230kV and would operate initially at 161kV.

During operation, the maximum noise level projected at the edge of the right-of-way for the transmission line would be nominally 57 dB(A) and would occur only in rain. This is not a substantial increase in noise level over typical rural background noise levels and would only slightly exceed the EPA recommended guidelines. The noise from the transmission line would not be higher than the noise associated with a stiff breeze. Furthermore, the increase would not be permanent.

Consequently, substantial noise impacts are not anticipated during the construction or operation of the transmission line**.**

Antelope Creek Substation

Construction noise is expected to be from 54 to 84 dB(A), but this would be a temporary increase (Table 3.14-1). The noise associated with the operation of the Antelope Creek Substation would be a combination of noise from the existing Richardson Coulee Substation and the new substation, which would cause an expected increase to the existing noise environment of approximately 3 dB, an increase that would be barely noticeable to most individuals. Noise levels more than 1,640 feet (500 meters) from the substation would be equivalent to background noise levels in a rural environment (BLM 2005). It is expected that at the substation fence the increased noise level would still be below EPA guidelines.

Alternative A

Wind Farm and Substations

Under Alternative A, impacts associated with wind farm and substation construction, operation, maintenance, and decommissioning would be identical to those discussed for the Proposed Action.

Transmission Route A

In general, noise impacts for Route A would be similar to those associated with Route C. In addition, Glasgow Air Force Base (decommissioned) would be just east of Transmission Route A. This former base is currently used by Boeing to conduct noise tests on the 777 jetliner and could at times overpower any noise associated with nearby construction and operation of the transmission line.

No substantial noise impacts are anticipated.

3.15 Air Quality

3.15.1 Affected Environment

The plains of eastern Montana are characterized by hot, dry summers and cold, dry winters. Annual precipitation is generally low, with thunderstorms producing a significant amount of the rainfall. Wind patterns are usually westerly. Visibility for the region is typically excellent, except during the occasional summer dust storm and occasional winter fog (Erp et al. 2003).

The VCWEP area is rural. There are no residences within 5 miles of the proposed wind farm. Along the alternative transmission routes nearer Glasgow and along the Milk River Valley, there are more residences, but these are dispersed and the area is still rural. Agriculture and a few sand and gravel quarries in the VCWEP area may contribute to particulate matter. In the proposed wind farm area, a Northern Border Pipeline compressor station may contribute to priority pollutants.

The EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, which are called "criteria" pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM), nitrogen dioxide ($N0_2$), ozone (0_3), and lead (Pb). The State has established Montana Ambient Air Quality Standards (MAAQS) that are in addition to the NAAQS (Table 3.15-1). Areas where pollutant levels exceed NAAQS are called non-attainment areas and states must develop plans for attaining and maintaining the NAAQS. Valley County is in attainment for all criteria pollutants (MDEQ 2004).

The affected environment for air quality is often characterized in terms of existing concentrations of criteria pollutants; however, there are no available data for calculating current or future air quality conditions in the VCWEP area. The closest monitoring station is in the Rosebud area (MDEQ 2004), over 120 miles to the south, and data from there are not relevant to the VCWEP area.

The Clean Air Act (CAA) regulates haze for certain national parks, wilderness areas, and national memorials. These are called Class I areas. The Bitter Creek WSA has not been identified as a mandatory or non-mandatory Class I area.

Table 3.15-1 National and State Ambient Air Quality Standards

Pollutant	NAAQS	MAAQS	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 mg/m3)	9 ppm	8-hour[1]	None
	35 ppm (40 mg/m3)	23 ppm	1-hour[1]	None
Lead	1.5 µg/m3	1.5 µg/m3	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m3)	0.05 ppm	Annual (Arithmetic Mean)	Same as Primary
Nitrogen Dioxide	- - -	0.30 ppm	Hourly	- - -
Particulate Matter (PM10)	50 µg/m3	50 µg/m3	Annual[2] (Arithmetic Mean)	Same as Primary
	150 ug/m3	150 ug/m3	24-hour[1]	
Particulate Matter (PM2.5)	15.0 µg/m3	-------	Annual[3] (Arithmetic. Mean)	Same as Primary
	65 ug/m3	-------	24-hour[4]	
Settleable Particulate		10 g/m2	30 day average	
Ozone	0.08 ppm		8-hour[5]	Same as Primary
	0.12 ppm	0.10 ppm	1-hour[6]	Same as Primary
Sulfur Oxides	0.03 ppm	0.02 ppm	Annual (Arithmetic. Mean)	-------
	0.14 ppm	0.10 ppm	24-hour[1]	-------
	-------	-------	3-hour[1]	0.5 ppm (1300 ug/m3)
Sulfur Oxides	-------	0.50 ppm	1- hour	-------
Visibility	-------	3x10 –5/m	Annual Average	-------

[1]Not to be exceeded more than once per year.
[2] To attain this standard, the expected annual arithmetic mean PM10 concentration at each monitor within an area must not exceed 50 ug/m^3.
[3] To attain this standard, the 3-year average of the annual arithmetic mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 ug/m^3.
[4] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 ug/m^3.
[5] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
[6] (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is <= 1, as determined by appendix H.
(b) The 1-hour NAAQS would no longer apply to an area one year after the effective date of the designation of that area for the 8-hour ozone NAAQS. The effective designation date for most areas is June 15, 2004. (40 CFR 50.9; see Federal Register of April 30, 2004 (69 FR 23996).)
Source: MDEQ 2004: EPA 2006

3.15.2 Environmental Consequences

Introduction

Air quality concerns for the VCWEP include fugitive dust from construction activities and exhaust emissions from construction equipment and vehicles. Emissions from construction would be confined to daytime activity for the duration of the six-to-eight-month construction period for each of the four phases. Air quality impacts from operations and maintenance activities are expected to be very short in duration and would not significantly affect overall ambient air quality. Because the VCWEP area is rural, there are no requirements for fugitive dust control other than taking standard and reasonable precautions and implementing proper dust control measures to ensure opacity limits are not exceeded.

The EPA and the State also control air toxics or hazardous air pollutants (HAPs).

No Action

Under the No Action Alternative there would be no impacts on local air quality, because the VCWEP would not be built.

Proposed Action

Wind Farm

Construction of the wind farm would create dust from site access, road construction, clearing and removal of vegetative cover, equipment lay down areas, storage areas and pads, foundation excavation and installation, O&M building construction, trenching for collector cable installation, and other areas of temporary disturbance. Construction equipment and vehicles would create vehicle exhaust (tailpipe emissions). A concrete batch plant would create particulates, and on-site diesel generators for the batch plant would add to priority pollutants. However, construction activities would be limited in extent and duration.

During construction of each phase of the wind farm, trucks, bulldozers, cranes, drill rigs, graders, backhoes, and other pieces of construction equipment would be required for up to eight months. The total number of pieces of equipment present at the construction site on a given day would be less. Construction would require the same types of equipment and duration for all phases, but the amount of equipment would vary depending on the number of turbines being built during a particular phase.

The Bitter Creek WSA is directly west of the proposed wind farm. Air quality in the WSA would not be affected by wind farm construction, because the prevailing wind is out of the west and fugitive dust produced at the wind farm would be distributed away from the WSA.

A wind farm is not considered a combustion source, and wind turbines do not produce direct emissions. The Wind Energy Development PEIS (BLM 2005) states that the operation of a wind energy development project would not adversely impact air quality. Vehicle travel and maintenance activities might generate minor tailpipe emissions and fugitive dust, but these activities would be limited in extent and should have no appreciable air quality impacts (i.e., measurable, but not triggering significance criteria) during any phase of wind farm construction, operations, or decommissioning.

Based on EPA's AP-42: Compilation of Air Pollution Emission Factors, approximate emission factors for each phase are conservatively estimated at 1.2 tons/acre/month for total suspended particulate (TSP) concentrations from construction activities scattered throughout an area. Dust emissions would be lower. Implementation of BMPs and other measures (e.g., water spraying, revegetation) would reduce fugitive dust.

Operating wind turbines do not produce emissions. There could be some minor Volatile Organic Compound (VOC) emissions during routine changes in lubricating and cooling fluids and greases. The other operations would generate fugitive dust from road travel and vehicular exhaust. All activities would be limited in extent and duration and should have no air quality impact.

Transmission Route C

Emissions associated with a linear project like a transmission line are usually minimal and would occur primarily from the use of equipment and access roads during construction. Vehicle travel would generate minor tailpipe emissions and fugitive dust, but these activities would be limited and would have no substantial air quality impact during construction and maintenance of the line.

Antelope Creek Substation

The Antelope Creek Substation would entail ground disturbance in an area of about five acres. Construction would require 11 workers over a four-to-six-month period. It is anticipated that there would be no appreciable impacts to local air quality from the construction, operation and decommissioning of the substation facility.

Alternative A

Under Alternative A, impacts associated with the wind farm, substation and Transmission Route A would be identical to those discussed for the Proposed Action.

3.16 Electric Transmission Grid and Reliability

Reliability of the interconnected transmission system is maintained and guaranteed through the Federal regulations governing generation interconnection and normal grid operations. New generation interconnections must not degrade the reliability or quality of the existing or planned transmission system (see Section 1.3). New generating facilities must comply with the Western Electricity Coordinating Council (WECC) New Generation Interconnection Policy regardless of where the interconnection takes place on the interconnected transmission grid. New facilities must also comply with the following reasonable and customary regulations and procedures:

- WECC Reliability Criteria for Transmission System Planning;
- North American Reliability Council (NERC) Planning Standards and Operating Policies;
- WECC Minimum Operating Reliability Criteria;
- WECC Progress Report Policies and Procedures;
- WECC Policy Statement on Power System Stabilizers;
- Procedures for Regional Planning Project Review and Rating Transmission Facilities; and
- Generation data validation.

New generation cannot be interconnected without appropriate system impact studies and facilities studies being prepared, as required under Federal regulations. At the time of the interconnection request, systems studies determine the impact to the transmission system and describe the means to add the transmission system additions to maintain reliability according to the standards identified above.

As discussed in Section 2.3, there is inadequate existing transmission in the vicinity of the proposed VCWEP to support full build-out of the project up to 500MW. The existing transmission system owned and operated by Western between Fort Peck and Havre is operated at 161kV, although currently built to

operate in the future at 230kV. Wind Hunter has the rights with Western to firm transmission service for 50MW, the last firm capacity available on this transmission line without an upgrade to 230kV. Additional capacity may be available on this transmission line on a non-firm basis, although this has never been requested.

The Fort Peck-to-Havre line can be upgraded to 230kV by replacing transformers and equipment in the four substations along the line that are owned and operated by NWE. The existing transformers convert the current transmission voltage from 161kV to 69kV for distribution to local electric cooperatives. A transformer upgrade to 230kV would create approximately 100MW of additional capacity on the Fort Peck-to-Havre line according to Western, but there appears to be little incentive for NWE to spend tens of millions of dollars on upgrades that are not a direct benefit to them. Therefore, it is uncertain how the Fort Peck-to-Havre line would be upgraded to gain the benefit to the project of an additional 100MW of firm transmission capacity. Western may be able to upgrade the Fort Peck-to-Havre line by constructing new substations or buying out NWE's interest in the existing stations. Wind Hunter could also choose to pay for the upgrades.

Firm transmission capacity beyond 150MW is not likely on the existing Fort Peck-to-Havre line. For the VCWEP to be built out to 500MW, new transmission lines would be needed, but since no markets are currently identified for the majority of the VCWEP, it cannot be ascertained what new transmission would be needed or where new transmission would be routed. Many transmission scenarios within Montana are being discussed. These include the Northern Lights Transmission Project, which is currently planning a collector transmission system into eastern Montana designed to bring power to a central point (possibly the Townsend area), then transmit it to the Southwest or other large markets.

3.17 Cumulative Impacts

3.17.1 Introduction

Under CEQ regulations, cumulative impacts can result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant, onsite and offsite actions occurring over a period of time. Similar projects or actions, as well as projects and actions that have similar impacts, can contribute to cumulative impacts.

The geographical area considered for the analysis of cumulative effects generally includes the same area as the Proposed Action and alternatives.

The existing conditions considered in the Affected Environment sections of Chapter 3 were shaped by impacts from current and past actions. Much of the project area is rural and undeveloped. However, changes in the project area have resulted from activities related to agriculture, grazing and ranching, natural gas conveyances, electric transmission lines, and outdoor recreation.

The only existing industrial development in the wind farm area is Northern Border Pipeline Company’s pipeline and Compressor Station No.1 (see Figure 2.3-2). The 42-inch natural gas pipeline runs from west to east through Phases I, II, and IV of the wind farm. The pipeline is part of a 1,249-mile pipeline system extending from the Montana-Saskatchewan border to the upper Midwest. Compressor Station No. 1 is located on a 40-acre site within the Phase IV area. Access to the facility is from Kerr Road. The unmanned facility contains a gas-fired turbine, one heating boiler, two emergency backup generators, and a microwave tower. The pipeline was initially constructed in 1981 and Compressor Station No. 1 was permitted in 1997.

For most of the VCWEP area, it is anticipated that, in general, current land uses (e.g., grazing, agriculture, and recreation) will continue into the foreseeable future. MDOT’s 2006-2008 Statewide Transportation

Improvement Program (STIP) lists only two road projects in the general vicinity of the VCWEP. One is an overlay on Montana Secondary 248 east of Opheim about 25 miles northeast of the wind farm area, and the other is a reconstruction of a portion of Montana Secondary 208 north of Malta about 40 miles west of the wind farm area. Neither road project would be likely to contribute to cumulative impacts in the VCWEP area.

No other major proposed actions have been identified with the possible exception of future oil and gas exploration and development.

The Mineral Leasing Act of 1920 (30 U.S.C. 181 et seq.), as amended by the Federal Onshore Oil and Gas Leasing Reform Act of 1987, requires that all Federal public lands not specifically closed to leasing be open to lease for the exploration and development of mineral resources. Such a lease grants the lessee the right to explore and drill for, extract, remove, and dispose of oil and gas deposits. The leases also allow ingress and egress, and identify a royalty interest to be paid to Federal and State governments on any production obtained. The leases are granted on the condition that the lessee will have to obtain BLM approval before conducting any surface-disturbing activities. Federally-managed public lands are available for oil and gas leasing only after they have been evaluated through the BLM's multiple-use planning process. Oil and gas leases expire after 10 years unless diligent drilling operations are in progress, the lease contains a well capable of producing oil and gas in paying quantities, or the lease is receiving or is entitled to receive an allocation of production.

For non-Federal lands, the Montana Board of Oil and Gas Conservation (MBOGC) regulates oil and gas development in the state by issuing drilling permits, establishing spacing units, and administering bonds. For Montana School Trust Lands, the DNRC Minerals Management Bureau is responsible for reviewing and processing lease and permit applications, reviewing and approving lease assignments, and collecting lease rentals and production royalties.

Environmental review would be required as part of the permitting process for oil and gas exploration and development under either NEPA or MEPA. Figure 3.17-1 illustrates the active and pending Federal and State leases in the proposed wind farm area, and an exploration well exists on a Montana School Trust Land lease in the Phase IV area of the wind farm. There is no current oil and gas production in the vicinity of the proposed wind farm, no information on planned exploration or development, and no available estimates on the probability of successful exploration. None of the State's oil and gas ownership under Transmission Route C is currently leased, but Route A does cross several leased tracts. There is considerable gas production in the Bowdoin Field along the Milk River in the western part of Valley County and oil production in the Lustre field in the eastern part of Valley County (J. Fahlgren, personal communication 2006), and the Judith Valley-Phillips RMP and EIS (BLM 1992) identifies the VCWEP area as having a moderate potential for oil and gas development.

3.17.2 Land Use

The construction and operation of a wind farm does not preclude oil and gas exploration or development. Likewise, because of safety concerns and the provisions of a 30-year Right-of-Way Grant from the BLM for the wind farm, oil and gas production on BLM land would not be permitted to conflict with the surface uses associated with the wind farm. Potential conflicts are unlikely because out of the 20,120 acres within the wind farm boundaries at full build-out, only 182.5 acres, less than 1 percent, would be permanently disturbed during construction and operations. Of this total, 176.6 acres would be permanently disturbed due to road construction. Also, special permits would be required from MBOGC on State and private land if the spacing is more than one well per 640 acres. In general, therefore, oil and gas development within the wind farm boundaries would be unlikely to interfere with wind farm operations.

If commercial quantities of oil or gas are encountered in the VCWEP vicinity in the future, developing the resource may require gas, water, and electric lines. Placing these facilities along roads or existing utility corridors could reduce cumulative impacts on land use.

It should also be noted that while the proposed new access roads in the wind farm area might accommodate oil and gas activities, the presence of these roads is not considered an incentive for oil and gas exploration and production because the mineral leases are already active or pending.

3.17.3 Transportation

Localized impacts to traffic volume (Section 3.3) could occur on roadways during wind farm construction and decommissioning. These impacts would be temporary. Multiple construction projects on similar or overlapping schedules could collectively contribute to congestion on local roads and highways. If extensive oil and gas exploration or production were to occur during any of the wind farm construction phases, the vehicles of workers and the vehicles used to transport equipment could add to traffic volumes if common roads (e.g., Kerr Road, State Highway 24) are used. However, there is no known schedule for oil and gas exploration and development in the area.

3.17.4 Visual Resources

The potential for cumulative effects on the visual landscape (Section 3.4) is dependent on future above-ground structures or facilities. If oil and gas exploration and production operations increase in the wind farm vicinity, the presence of drill rigs, capped well heads and other equipment may cumulatively contribute to a landscape change caused by the introduction of additional man-made elements into a landscape that is mostly natural and agricultural.

3.17.5 Socioeconomics and Public Services

In terms of socioeconomics (Section 3.5), beneficial impacts associated with the VCWEP would be likely. These benefits would include the creation of new jobs; increased area income, sales and income tax revenues; and right-of-way grant/easement income, production rent, and royalties to Federal, State and local governments. If oil and gas exploration and development were to occur in the wind farm area or elsewhere in Valley County, similar benefits could occur, so the cumulative socioeconomic impacts would be beneficial.

3.17.6 Environmental Justice

Given the absence of known environmental justice issues in the project area (Section 3.6), the VCWEP is not expected to contribute to cumulative impacts to environmental justice. The proposed wind farm in combination with possible future oil and gas activities in the area could contribute to the cumulative industrial development of the ancestral lands of different tribes. While initial Section 106 consultation with Montana tribes has not resulted in the identification of specific environmental justice issues, it is not known whether oil and gas development would generate a similar response.

3.17.7 Biological Resources

The Proposed Action, when combined with future oil and gas development, could cause cumulative impacts to biological resources (Section 3.7). To the extent that future oil and gas development occurs on BLM and DNRC-administered lands, proper design and planning, including avoiding mule deer winter range and sensitive wildlife habitat, could reduce the potential cumulative effects to important habitats and sensitive species. Some habitat fragmentation would be an unavoidable impact of oil and gas development depending on the number of exploration and production wells; well spacing; and the construction of roads, electric lines, pipelines, and other facilities.

Figure 3.17-1 Oil and Gas Leases in the Wind Farm Area

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The additional workers, trucks, and construction equipment coming into the area for oil and gas exploration and development would increase the cumulative risk of the spread of noxious weeds. This risk could be reduced with implementation of measures similar to those discussed in Appendix C.

3.17.8 Water Resources and Wetlands

Oil and gas exploration and development can potentially have high impacts on surface water and groundwater. Drilling fluids can contaminate soil and surface water, and drilling often removes large amounts of groundwater, potentially affecting aquifer stability and recharge. The disposal of this water, which is often contaminated, can adversely impact water resources. Before the water produced can be discharged into Surface Waters of the State, DEQ must issue a National Pollutant Discharge Elimination System (NPDES) permit. If the produced water is to be used for irrigation, stock water, or industrial activities, the water would require treatment to remove contaminants, solids, and heavy metals. A beneficial use permit would be required from DNRC.

To the extent that future oil and gas development occurs on BLM and DNRC-administered lands, proper design and implementation of BMPs, such as closed loop drilling, could minimize some of the cumulative surface water and groundwater impacts.

Substantial impacts to water resources and wetlands (Section 3.8) are not expected from the wind farm, so the Proposed Action would have a minimal contribution to cumulative impacts to water resources.

3.17.9 Geology and Geohazards

Impacts to geological resources and geohazards (Section 3.9) from the VCWEP are not expected to be substantial with careful design and implementation of BMPs. Likewise, oil and gas exploration and development on BLM and State lands would be performed with appropriate measures to minimize impacts. Nonetheless, the occurrence of drilling, road construction, and other activities on certain landforms (such as Bearpaw Shale) could contribute to a cumulative increase in an overall geohazard risk in the area.

3.17.10 Soils

Cumulative impacts to soils (Section 3.10) from wind farm construction and operation are not expected to be substantial, and the implementation of BMPs would reduce them still further. Oil and gas exploration activities, such as seismic exploration, can damage some soils. To the extent that future oil and gas development occurs on BLM and DNRC-administered lands, proper design and planning for future development, including lease stipulations, and implementing BMPs would minimize cumulative impacts. For example, permits for oil and gas exploration and development typically contain requirements for reclamation and reseeding prior to abandonment and decommissioning.

3.17.11 Paleontology

BMPs and mitigation measures addressing paleontological resources (Section 3.11) would limit potential impacts at the VCWEP site. On BLM and State lands, similar measures would reduce direct impacts caused by oil and gas exploration and development. However, improved access and the presence of construction and operations workers for either the VCWEP or future oil and gas activities could contribute cumulatively to the potential loss of paleontological resources through theft, vandalism, or accidental disturbance.

3.17.12 Cultural Resources

Oil and gas development could potentially cause impacts to cultural resources (Section 3.12). As with the VCWEP, oil and gas exploration and development on Federal and State lands would have to comply with

Section 106 of the NHPA, ARPA, or the Montana Antiquities Act. Through this process, measures would be developed and implemented to mitigate impacts on cultural resources. However, improved access and the presence of construction and operations workers for either the VCWEP or future oil and gas activities could contribute cumulatively to the potential loss of cultural resources through theft, vandalism, or accidental disturbance. Cumulative impacts on TCPs are difficult to estimate without additional information from affected Native American groups regarding the presence and sensitivity of such resources.

3.17.13 Health and Safety

The Proposed Action's contribution to cumulative impacts on health and safety would be low with the implementation of various plans and procedures (Section 3.13). Oil and gas exploration and development in the same area would increase the risk cumulatively, but with proper safeguards and procedures, these risks should remain small. For example, the application of spill prevention control and countermeasures and appropriate treatment of wastewater and waste materials would reduce the cumulative risk to health and safety.

3.17.14 Noise

Construction noise associated with the VCWEP would be temporary and would not contribute to a long-term cumulative impact to the noise environment. During wind farm operations, noise generated by turbines, substations, transmission lines, and maintenance activities would approach typical background levels for rural areas (Section 3.14). Depending on location, oil and gas activities in the same locations at the same time could make a more substantial contribution to a cumulative increase in noise emissions. For example, drilling rigs, compressors, and drills can generate high levels of noise, sometimes for 24 hours a day. The effects of loud, continuous noise from oil and gas activities on wildlife is of concern, especially if the noise leads to species displacement.

3.17.15 Air Quality

Dust generated during construction of the wind farm would be temporary. Dust generated during oil and gas exploration and development would have a cumulative impact to the extent that activities coincided in time and place with wind farm construction.

The small number of employees and associated trips during VCWEP operations would not have a noticeable effect on regional air quality (Section 3.15). Also, wind turbines do not generate emissions. For oil and gas activities, there is a greater potential for air quality impacts. The operation of compressors and generators might require an air quality permit from DEQ. Best available control technology (BACT) may be required to reduce diesel engine emissions. Also, MBOGC would require a permit if there is intent to vent natural gas into the atmosphere. These and other measures may reduce air emissions from oil and gas exploration, thereby reducing the cumulative impact as well.

3.18 Irreversible and Irretrievable Commitment of Resources

Resources committed to the VCWEP would consist of both material resources and nonmaterial resources, including financial resources. For the purposes of this EA, the "irreversible commitment of resources" refers to those resources that, once committed to the VCWEP, would continue to be committed throughout the 20-year life of the project or longer if the wind farm operates beyond the anticipated 20 years. The "irretrievable commitment of resources" refers to those resources that, once used, consumed, destroyed or degraded during construction, operation, maintenance, or decommissioning of the VCWEP, could not be retrieved or replaced during the 20-year life of VCWEP or beyond. Irreversible and irretrievable commitments of resources for the VCWEP are summarized in Table 3.18-1.

Table 3.18-1 Irreversible and Irretrievable Commitment of Resources

Resource	Type of Commitment	Irreversible	Irretrievable
Land Use	Exclusion of future land uses in project area. Wind farm would reduce opportunities for solitude in the eastern portion of the Bitter Creek WSA	Yes	Project life
Transportation	Temporary road closures and increased traffic during construction.	No	No
Visual Resource	Degradation of scenic quality during construction and operations	Yes	Project life
Socioeconomics and Public Services	Increased regional and local revenues during construction and operation	Yes	Project life
Environmental Justice	None identified	No	No
Biological Resources	Habitat fragmentation; disturbance or loss of vegetation and wildlife species during construction and operations	Yes	Yes or No, depending on particular habitat type and species
Water Resources and Wetlands	Erosion possibly affecting water resources	No	Project life
Geology and Geohazards	Possible slope failure	Yes	Yes
Soils	Soil loss and erosion during construction	Yes	Yes
Paleontology	Loss or damage during construction and operations	Yes	No, if mitigated.
Cultural Resources	Disturbance of resources during construction and operations	Yes	No, if mitigated.
Health and Safety	Electric fields below Montana standards. Magnetic fields would still persist.	No	Project life
Noise	Short-term and intermittent increases in noise during construction and operations	Yes	Project life
Air Quality	None, if BMPs implemented during construction and operations.	No	No
Electric Transmission Grid and Reliability	Sufficient capacity on Fort Peck-to-Havre transmission line for power generated by wind farm during Phase I	Yes	Project life
Construction Materials and Fuels	Use of materials, water, and fuels during construction and operations	Yes	Yes or No, depending on material

3.19 Unavoidable Adverse Impacts

Committed mitigation measures presented in Appendix A would be applied to potentially adverse impacts to reduce or avoid the identified impacts. Some measures would be incorporated into the design of the VCWEP; others would be implemented before or during construction, operation and maintenance, and decommissioning. However, even with these mitigation measures there is the potential for unavoidable adverse impacts resulting from implementation of the Proposed Action or Alternative A. For example:

- The presence of MET towers, wind turbines and transmission lines can be hazardous to aerial crop spraying operations, can lower the effectiveness of aerial spraying, or can increase costs for materials and aircraft operations over these structures. Landowners would be consulted to determine which aerial applications cover agricultural lands near the wind farm and transmission line. Prior to the erection of the structures, written notification and clear maps showing structure locations would be provided to aerial applicators. While these measures would likely reduce the level of impact, the safety hazard to aerial applicators would remain unavoidable.

- The presence of wind turbines and transmission structures would interfere with some farming activities on cultivated land.

- The presence of wind turbines represents an unavoidable adverse impact for many viewers because they would alter the appearance of the rural landscape over a large area. Flashing lights on the turbines would similarly be considered an unavoidable adverse impact. The degree of visual impact would depend on each viewer's location and sensitivity and on the quality of the view, as discussed in Section 3.4. To a lesser extent, the transmission line and proposed substation would alter the appearance of the rural landscape.

- Some biological resources would be lost due to the construction, operation and maintenance of the VCWEP. Construction of the wind farm, transmission lines and substation would result in the permanent loss of from 172 acres (Proposed Action) to 208 acres (Alternative A) of native vegetation and wildlife habitat. Small quantities of mule deer winter range and habitat for greater sage grouse and sharp-tailed grouse would also be lost. Operation of the wind farm and transmission line would result in avian and bat mortalities, with specific levels largely determined by the number of turbines constructed. Mitigation measures, discussed in Section 3.7 and listed in Appendix A, would be implemented to minimize the loss of biological resources. Nonetheless, some loss of habitat and some wildlife mortality are unavoidable.

- Cultural resources can often be avoided by adjusting the locations of wind tower sites, transmission line structures, and access roads. For those that cannot be avoided, data recovery and measures would mitigate impacts. The Section 106 Programmatic Agreement being developed for the VCWEP recognizes that previously unknown cultural resources may be discovered during construction. Likewise, new roads could result in increased use of public lands in the VCWEP area, and it is possible that cultural resources could be intentionally or accidentally disturbed as a result. Monitoring and other measures would substantially reduce the risk of such accidental discovery and disturbance, but cannot eliminate the risk entirely. No TCPs or sites of religious or cultural concern to Native Americans have been identified in the VCWEP area. Should such resources be identified in the future, the level of impact and the feasibility of mitigation would be determined through tribal consultation. It is possible that such impacts, if any, would be considered by the tribes to be unavoidable.

- Even though mitigation measures would be applied, it is still possible that paleontological resources could be accidentally destroyed or damaged during construction and operation. Also, new roads would likely result in increased use of public lands in the VCWEP area, and it is possible that fossils could be illegally collected or accidentally disturbed or damaged as a result.

CHAPTER 4 CONSULTATION AND COORDINATION

4.1 Introduction

The consultation and coordination process for the VCWEP has been performed to comply with MFSA, NEPA and MEPA. To complete an Application and Environmental Report for Montana DEQ under MFSA, Wind Hunter completed initial issues identification and scoping activities. In response to NEPA, CEQ regulations and MEPA, a scoping process was developed for the VCWEP to ensure that interested parties, including Federal, State and local agencies, organizations, interested persons, landowners and the public were contacted, consulted and given an adequate opportunity to be involved in the process. This chapter describes the scoping process, comments received, issues identified, topics discussed, formal and informal consultation, and other communications.

4.2 Initial Consultation and Coordination

Consultation with Western began in 2002 when Wind Hunter (formerly First American Energy) made a request for interconnection with Western's transmission system on the Fort Peck-to-Havre 161kV transmission line near Tampico. In early 2003, Western prepared a System Impact Study to evaluate the potential effects to the transmission system of a 50MW wind resource interconnection. A Facilities Study was completed in September 2003 to evaluate the costs and options associated with the interconnection and transmission system improvements.

As required by MFSA rules and procedures, Wind Hunter coordinated with local communities, interest groups, and agencies to incorporate comments, issues and suggestions into the project proposal. During 2004, Wind Hunter held over 20 separate meetings with Federal and State agencies (Western, BLM, USFWS, DEQ, and DNRC), the Governor's Task Force on Transmission, the Montana Governor and staff, Valley County Commissioners, City of Glasgow, Northern and Valley Electric Cooperatives, Two Rivers Economic Growth, Inc. Board of Directors, several landowners, concerned citizens, and the Montana Environmental Information Center.

4.2.1 Initial Public Scoping Process

On July 27, 2004 a scoping letter was mailed to interested parties, including Federal, State, and local agencies, landowners, oil and gas lessees on public lands, grazing lessees on public lands, and over 30 environmental interest groups and non-governmental organizations. The letters provided information about the project, solicited comments, and announced the time and location of the upcoming public scoping meeting. More than 400 scoping letters were mailed to interested parties.

Wind Hunter hosted the public scoping meeting at the Elks Lodge in Glasgow on August 17, 2004. Attendance at the meeting was substantial, with more than 90 participants. While these meetings were not held as part of the NEPA/MEPA process, they did serve to inform the public about various aspects of the proposed project and assist with the development of scoping issues and concerns. Questions primarily concerned technical and socioeconomic aspects of the VCWEP, including equipment to be used and tax issues. Some general questions about energy costs and production were also addressed. The key issues and topics identified during this scoping process include:

- Community and land use impacts.
- Avian impacts.
- Visual impacts.
- Bitter Creek WSA.

- Remote and intact grassland prairie landscape.
- Wildlife habitat fragmentation.
- Cultural resources.

4.3 Formal and Informal Consultation and Coordination

Consultation and coordination for the VCWEP is taking place to comply with Section 106 of the NHPA, Section 7 of the ESA, and the NEPA/MEPA and MSFA environmental review.

4.3.1 Section 106 Consultation

Contacts with the Montana SHPO were initiated by Wind Hunter in May 2004 during the environmental resources inventory for the MFSA Application, and continued throughout the MFSA process. Frequent conversations were held by Wind Hunter with MHS and BLM staff during the environmental analysis process regarding the quality of past cultural resource studies; the content of inventory forms and reports; current survey and site recording standards; and criteria for evaluating the NRHP eligibility of cultural resources in the VCWEP study area.

Western is the lead for the NHPA Section 106 process. In 2005, as part of the Section 106 process, BLM, Western, DNRC, Montana SHPO, and Wind Hunter developed a draft Programmatic Agreement addressing the various tasks required to ensure completion of the Section 106 process for the VCWEP. The draft Programmatic Agreement is currently being reviewed by the agencies and by Montana tribes.

Also as part of the Section 106 process, in 2005 all tribes in Montana were contacted about the VCWEP and the draft Programmatic Agreement to determine if they had concerns about the project in general and about cultural resources in the project area. Tribes invited to be signatories of the Programmatic Agreement include the Fort Peck Tribal Executive Board of the Assiniboine and Sioux Tribes of the Fort Peck Reservation; the Gros Ventre and Assiniboine Tribes of the Fort Belknap Indian Community of the Fort Belknap Reservation; the Blackfeet Tribal Business Council of the Blackfeet Tribe; the Chippewa Cree Business Committee of the Rocky Boy Reservation; and the Little Shell Tribe of Chippewa Indians of Montana. A monitor from the Fort Peck Reservation participated in an intensive cultural resources survey of portions of the VCWEP area in August 2005. In September 2005, a field trip to the VCWEP area was made by representatives of the Rocky Boy Reservation, BLM, and Wind Hunter. On December 9, 2005, a formal Section 106 consultation meeting was held in Great Falls, Montana. The meeting was attended by representatives from Western, BLM, Wind Hunter, and the Fort Peck Reservation.

The Section 106 consultation process is ongoing. Additional field visits to the project area and consultation meetings are anticipated.

4.3.2 Section 7 Consultation

To comply with the Endangered Species Act (1973), formal Section 7 consultation with the USFWS will be initiated upon completion and submittal of a Biological Assessment.

4.3.3 Other Biological Resource Coordination

Meetings and correspondence have occurred with BLM, USFWS, and MFWP staff regarding biological resources in the VCWEP area, including obtaining species lists and maps of sensitive species and important habitat. There also has been coordination with BLM and MFWP staff in planning 2005 and 2006 wildlife surveys in the VCWEP area.

4.3.4 EA Public Scoping Process

Federal and State agencies initiated a NEPA/MEPA public scoping process and invited public comments on the content and issues that should be addressed in the environmental analysis and review. The scoping process began with the development of a mailing list of Federal, State, and local agencies; landowners; oil, gas and grazing lessees on public lands; non-governmental organizations; environmental groups; and other interest parties.

More than 500 contact letters, with an attached fact sheet and project area map, were mailed prior to public scoping meetings. The letter and fact sheet provided information about the VCWEP, announced the time and location of the public scoping meetings and invited the public, agencies and interest groups to provide information and guidance, suggest issues that should be examined and express their concerns. The scoping period was 45 days from May 10, 2005 to June 24, 2005.

BLM, Western, FSA, DEQ, and DNRC held two public scoping meetings, one in Glasgow on May 24, 2005 and one in Helena on May 26, 2005. In Glasgow, the public scoping meeting was held in the Elks Lodge with 41 individuals attending. The public scoping meeting in Helena was held in the Metcalf Building, with 12 individuals in attendance. Presentations were made by the agencies and Wind Hunter about the VCWEP and the joint environmental review process, and issues, concerns, and comments were recorded. In addition, comment forms were made available for the public to submit written comments at and following the meeting. Verbal comments received during the meeting were recorded and posted. Eighteen comment letters and written comment forms were received. All verbal and written comments were incorporated into the issues and concerns that are the focus of this EA. A Scoping Summary Report was prepared in July 26, 2005 (BLM, DEQ, Western, and DNRC 2005).

Questions voiced were primarily concerned with revenue, energy costs, production, and technical and socioeconomic aspects of VCWEP. Some of the key issues and topics identified during the scoping process include:

General

- Alternative locations for the wind farm and transmission line.
- Use of existing roads to serve the transmission lines.
- Transmission line right-of-way widths.
- Value of transmission and tower easements on State and BLM lands.

Cultural Resources

- Effects on tipi rings and other cultural resources.

Land Use

- Transmission line interference with use of private airstrips.
- Transmission line interference with farming activities.

Water Resources

- The need for new and upgraded creek crossings for the transmission line.

Biological Resources

- Impacts to grouse.
- Bird migratory patterns.
- Impacts of wind turbines on birds and bats.
- Effects on habitat for threatened and endangered species, and other wildlife.
- Effects on ground squirrels and prairie dogs.

- Transport of noxious weeds.
- Need to replant with native grass varieties.

Socioeconomics

- Jobs brought to Montana.
- Number of workers to be employed during operation.
- Taxes received by Valley County.

Wilderness Study Area

- Effects of wind turbines on the solitude of the Bitter Creek WSA.

Visual Resources

- Visual and aesthetic impacts of the transmission line on homes and outfitting businesses.
- Views of the turbines from the Bitter Creek WSA.

Health and Safety

- Power frequency harmonics from the wind farm interfering with telephone communication.

More information about the scoping process and meetings are included in a Scoping Summary Report prepared by BLM, Western, DEQ, and DNRC (2005).

4.4 Public Review of the EA

Public review of the EA will be completed following a 30-day comment period. If no significant impacts are identified and the VCWEP is approved, the Lead Agencies will issue a Finding of No Significant Impact (FONSI) for the proposed project, and other permits and certifications will be issued.

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APPENDIX A
Committed Mitigation Measures

COMMITTED MITIGATION MEASURES

Wind Hunter's goal on the Valley County Wind Energy Project (VCWEP) is to minimize effects on the environment during construction and operation of the VCWEP. This appendix describes:

- General Construction Protocols – measures that Wind Hunter commits to doing during construction and operation of the VCWEP.
- Selectively-Committed Mitigation – measures that will be applied to site-specific impacts identified in this Environmental Assessment (EA).
- Project Mitigation Commitment – broad mitigation objectives committed by Wind Hunter to reduce impacts of the transmission interconnection.

In addition, Environmental Specifications developed by the State of Montana and presented in Appendix E will be combined with the general and specific mitigation measures into a combined pre-construction document that will satisfy the requirements of the Lead and Cooperating Agencies.

General Construction Protocols

Wind Hunter commits to observing the following general protocols as part of construction of the VCWEP. These practices are considered a part of the Project Description (refer to Chapter 2).

Transportation

- Construction vehicle movement outside the right-of-way typically will be restricted to pre-designated access, contractor-acquired access, or public roads.
- Existing roads used for construction will be left in a condition equal to or better than their condition prior to the construction of the project.

Resource Protection

- The areal limits of construction activities typically will be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents will be applied to rocks or vegetation to indicate limits of survey or construction activity.
- Prior to construction, all supervisory construction personnel will be instructed on the protection of cultural, paleontological, and ecological resources. To assist in this effort, the construction contract will address: a) Federal and State laws regarding antiquities, fossils, plants and wildlife, including collection and removal; b) the importance of these resources and the purpose and necessity of protecting them; and c) methods for protecting sensitive resources.
- Cultural and biological resources will continue to be considered during post-NEPA phases of project implementation. This will involve pedestrian surveys to inventory and evaluate these resources within the project area and any appurtenant impact zones beyond the corridor, such as access roads and construction equipment yards. In consultation with appropriate land managing agencies, specific mitigation measures will be developed and implemented to mitigate any identified adverse impacts on State or BLM lands. These may include project modifications to avoid adverse impacts, monitoring of construction activities, or data recovery studies. Wind Hunter will notify the BLM Authorized Officer by telephone, with written confirmation, immediately upon the discovery of any cultural or paleontological resources (historic or

prehistoric site or object, human remains, funerary items, or sacred objects) on Federal public lands. All operations in the immediate area of such discovery will be suspended until written authorization to proceed is issued by the BLM Authorized Officer. The Section 106 Programmatic Agreement will contain more explicit procedures for emergency discoveries of cultural resources and the treatment of human skeletal remains.

- If paleontological resources are encountered, mitigation efforts will be developed to protect the resources.

- Mitigation measures developed during the consultation period under Section 7 of the Endangered Species Act (1973) as amended will be adhered to as specified in the Biological Opinion of the U.S. Fish and Wildlife Service.

- The boundaries of sensitive plant populations, cultural resources, and other sensitive resources will be clearly delineated with easily-visible flagging or fencing.

Ground Disturbance and Site Restoration

- In construction areas where recontouring is not required, vegetation will be left in place wherever possible and original contour will be maintained to avoid excessive root damage and allow for resprouting.

- In construction areas (e.g., marshaling yards, tower sites, spur roads from existing access roads) where ground disturbance is substantial or where recontouring is required, surface restoration will occur as required by the landowner or land management agency. The method of restoration will typically consist of returning disturbed areas back to their natural contour, reseeding (if required), installing cross drains for erosion control, placing water bars in the road, and filling ditches.

- In the event of obliteration or disturbance of any General Land Office or BLM Cadastral Survey corners, reference corners, witness points, etc., Wind Hunter will immediately report the incident to the BLM Authorized Officer and make arrangements to restore the disturbed monument.

Land Uses

- If existing improvements are damaged or destroyed by construction activities, they will be repaired or replaced to their condition prior to disturbance as agreed to by the parties involved.

- If fences and gates are removed, damaged or destroyed during construction activities, they will be installed, repaired or replaced to their original condition as required by the landowner or the land management agency. Temporary gates will be installed only with the permission of the landowner or the land management agency and will be restored to original condition following construction.

Radio, TV Interference and EMF

- Wind Hunter will respond to complaints of radio or television interference generated by the transmission line by investigating the complaints and implementing appropriate mitigation measures. The transmission line will be patrolled on a regular basis so that damaged insulators or other transmission line materials, which could cause interference, are repaired or replaced.

- Wind Hunter will apply mitigation needed to eliminate problems of induced currents and voltages onto conductive objects sharing a right-of-way to the mutual satisfaction of the parties involved.

- A bundle configuration and large diameter conductors will be used to limit the audible noise, radio interference, and television interference due to corona. Caution will be exercised during construction to avoid scratching or nicking the conductor surface, which may provide points for corona to occur.

Stream Protection

- Roads will be built at right angles to the streams and washes to the extent practicable. Culverts will be installed where needed. Construction and maintenance activities will be conducted in a manner that will minimize disturbance to vegetation, drainage channels, and stream banks (e.g., towers would not be located within a stream channel).

Permits for Construction

- Requirements of those entities having jurisdiction over air quality matters will be adhered to and any permits needed for construction activities will be obtained. Open burning of construction trash will not be allowed unless permitted by appropriate authorities.

Hazardous Materials

- No biodegradable or non-biodegradable debris will be deposited in the right-of-way.

- Hazardous materials will not be drained onto the ground or into streams or drainage areas. Totally enclosed containment will be provided for all trash. Construction waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials, will be removed to a disposal facility authorized to accept such materials.

Noxious Weeds

- Prior to construction, a noxious weed control plan will be developed to prevent the spread of noxious weeds in the project area.

- Construction vehicles used on project access roads will be washed and cleaned of possible weed seeds before entering the project area.

Visual Impacts

- Non-specular conductors will be used to reduce visual impacts.

- Wood H-frame structures will be used for the transmission interconnection to reduce visual contrasts.

Selectively Committed Mitigation

Mitigation measures recommended to reduce or eliminate site-specific impacts are referred to as selectively committed mitigation. Wind Hunter has committed to mitigating identified site-specific impacts using the methods identified. Refer to Chapter 3 for a detailed assessment of VCWEP impacts and an explanation of how and when “Selectively Committed Mitigation Measures” would be used. Mitigation measures are presented below:

1) In areas where soils and vegetation are particularly sensitive to disturbance, existing access roads will be repaired only in areas where they are otherwise impassable.

2) In selected areas on public lands, access roads that disturb sensitive features will be rerouted or will cross overland. That is, construction and maintenance traffic will use existing roads or cross-country access routes (including the right-of-way). To minimize ground disturbance, construction traffic routes must be clearly marked with temporary markers such as easily visible flagging. The construction routes or other means of avoidance must be approved in advance of use by the authorized officer or landowner.

3) To minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape, the alignment of any new access roads or cross-country route will follow the landform contours in designated areas where practicable, providing that such alignment does not impact other resource values.

4) To limit new or improved accessibility into the area, all new access undesired or not required for maintenance will be closed using the most effective and least environmentally damaging methods appropriate to that area with concurrence of the landowner or land manager.

5) To minimize the amount of sensitive features disturbed and/or reduce visual contrast, in designated areas structures will be placed so as to avoid sensitive features such as, but not limited to, cultivated land, riparian areas, water courses, and cultural resources, and/or placed to allow conductors to clearly span the features, within limits of standard tower design. If the sensitive features cannot be completely avoided, towers will be placed so as to minimize the disturbance.

6) To reduce visual impacts, potential impacts on recreation values and safety, at highway and trail crossings, tower structures will be placed at the maximum feasible distance from the crossing within limits of standard tower structure design.

7) With the exception of emergency situations, construction, restoration, maintenance, and decommissioning activities will be modified or curtailed in designated areas during sensitive periods (e.g., nesting and breeding periods) for endangered, threatened, or sensitive wildlife species. No such activities will occur in the wind farm area or along the selected transmission line route within: 1) 1 mile of an active sage-grouse or sharp-tailed grouse lek; 2) mule deer winter range during winter months; and 3) within cottonwood riparian winter habitat for bald eagle during winter months. Sensitive periods and areas of concern would be determined in consultation with BLM and MFWP, and activities in sensitive areas would be approved in advance of construction or maintenance by the authorized officer

8) New access roads constructed in mule deer winter range will be gated during winter months to preclude public access.

9) Placement of transmission lines over ponds will be avoided, wherever feasible.

10) Surveys for sensitive plant species will be conducted to inventory and evaluate these resources within the project area and any appurtenant impact zones, such as access roads and construction equipment yards. In consultation with appropriate land managing agencies, specific mitigation measures will be developed and implemented to mitigate any adverse impacts on State or BLM lands. These may include project modifications to avoid adverse impacts, monitoring of construction activities, or data recovery studies.

11) Greater sage-grouse and sharp-tailed grouse lek surveys will be conducted to inventory and

evaluate these resources within the wind farm area, selected transmission line corridor, and associated impact zones prior to construction. Specific mitigation measures will be developed and implemented in coordination with BLM and MFWP to mitigate potential adverse impacts. These measures may include project modification and post-construction monitoring. Raptor excluders will be placed on all transmission towers that are located within 0.5 mile of an active lek and winter range.

12) Single-pole tubular steel structures will be utilized in cultivated areas and across the Milk River Valley to minimize ground disturbance, operational conflicts, and/or visual contrast.

13) To minimize visual contrast, corten steel or wood poles will be used.

14) Outside areas discussed under # 12, H-frame structures will be used to reduce the amount of new structure contrast and maximize the spans between structure locations.

15) Non-reflective neutral and light gray paints and coatings will be used to reduce reflection, glare, and/or contrast. Turbines, visible accessory structures, and other equipment painted surfaces will be protected so as to preserve the non-reflective paint, or painted immediately before or after installation. The O&M building will be an earthtone finish to reduce visual contrast with the surrounding landscape. No uncoated galvanized metallic surfaces will be used to prevent oxidation because it would result in stronger visual contrast.

16) Where security lights are necessary, they will be activated by motion detection to avoid night-time contrast between the project and the night sky.

17) In areas where significant paleontological resources may be encountered, a field inventory will be completed prior to construction activities. The inventory will result in development of specific mitigation measures to avoid adverse impacts, such as monitoring of construction activities, avoidance, or data recovery.

18) The project will comply with all appropriate regulations of the Federal Aviation Administration (FAA), and a Notice of Proposed Construction or Alteration form (Form 7460-1) would be required of Wind Hunter for each phase of the project development pursuant to Federal Aviation Regulations, Part 77. Final locations, structures, and structure heights, including wind turbines, transmission lines, meteorological towers, and construction equipment that might impact air navigation, such as cranes used to assemble the towers, would be submitted to the FAA. The form would be sent to the manager of the FAA Regional Air Traffic Division Office having jurisdiction over the area where the planned construction would be located. If acceptable to the FAA, white lights will be utilized on turbines and towers to minimize the risk of avian collisions. Coordination with the Department of Defense will be conducted regarding the location and potential effects of the project upon operations in military airspace. The owner/operators of private airports and airstrips potentially affected by the project will also be contacted.

19) Construction will be timed, whenever practical, to minimize disruption of normal seasonal activities for cropland (planting and harvesting) and non-irrigated pasture/rangeland.

20) Coordination with landowners, lessees, and companies during final wind farm and transmission line design will be conducted, to the extent feasible, so as to minimize potential land use conflicts with oil and gas leases, permitted sand and gravel operations, natural gas pipelines, and proposed water pipelines, and to maximize the distance between the transmission line and agricultural operations, planned developments, canals, apiaries, and airstrips located within, adjacent to, and

near the right-of-way.

21) To the extent feasible, project facilities, including structures and access roads, will be installed along the edges or borders of property. Consultation with the landowner or land management agency will be conducted to identify facility locations that create the least potential for impact to property and its uses.

22) Farmers will be compensated for crop damage, and compacted soils will be restored.

23) On agricultural land, transmission towers and right-of-way will be aligned with field boundaries to the greatest extent practicable and transmission towers will be placed near field boundaries, access roads, and fences to reduce the impact to farm operation and agricultural production. Where this is not possible because of irregular field boundaries, the transmission towers will be placed on or perpendicular to the row crops wherever feasible, so that transmission lines do not run diagonally to the crop rows.

24) Cultural resources will continue to be considered during post-NEPA phases of project implementation. A Programmatic Agreement will be developed by BLM, Western, Montana SHPO, DEQ, DNRC, concerned Tribes, Wind Hunter, and other interested parties to ensure compliance with Section 106 of the National Historic Preservation Act (NHPA). This Programmatic Agreement will address, among other topics, inventory procedures for the selected alternative, procedures for evaluation of cultural resources, and mitigation measures. Mitigation measures may include, but not be limited to, avoidance of the resource, monitoring of construction activities, and data recovery.

25) Survey vehicles will be cleaned prior to entering the area. Prior to construction, the construction contractor will be trained on methods for cleaning equipment, identification of problem plant species in the project area, and procedures to follow when an invasive or noxious weed is located. To assist in identification, the contractor will be supplied with a list and pictures of noxious and invasive species that may exist within the project area.

26) Prior to entering relatively weed-free areas, vehicles and construction equipment will be cleaned (pressure wash) of mud, dirt, and plant parts. This will be done to remove weed seed that may be attached to this equipment. Washing will only occur at designated sites (i.e., construction yards), that include appropriate containment systems.

27) Equipment, materials, and vehicles will be stored at specified work areas or construction yards. Personal vehicles, sanitary facilities, and staging areas will be confined to a limited number of specified weed-free locations to decrease chances of incidental disturbance and spread of noxious weeds and invasive plants

28) Disturbed areas (e.g., access roads and staging areas) will be promptly seeded following completion of construction activities to reduce the potential for the spread and establishment of noxious weeds and invasive plants. Seeding should occur as soon possible following construction and during the optimal time period. Only BLM, DNRC, and DEQ-approved mixtures of certified “weed-free” seed will be used. All other introduced construction materials used for the proposed project, such as straw and fill, shall also be weed-free.

29) In designated areas, wind farm infrastructure will be placed so as to avoid sensitive features such as, but not limited to, riparian areas and watercourses, within limits of reasonable design. If these sensitive features cannot be completely avoided, infrastructure will be placed so as to minimize

the disturbance.

30) A comprehensive wildlife study plan will be developed and implemented in coordination with USFWS, BLM, and MFWP. This plan will include pre-construction surveys and post-construction monitoring within the wind farm area and along the selected transmission line alternative. Pre-construction studies will include surveys of: 1) sage-grouse and sharp-tailed grouse leks and winter range; 2) distribution and abundance of passerines and raptors; 3) raptor nests; 4) mule deer winter range; 5) bat species; 6) reptiles and amphibians; and 7) swift fox. Post-construction monitoring will include changes in and the distribution and abundance of all species surveyed, including grouse lek use as well as avian and bat mortality at the wind farm. Data from surveys and monitoring will be used to adaptively manage the operation of existing turbines and siting of future turbine strings. Raptor excluders will be placed on transmission towers where appropriate.

31) To avoid or minimize potential microwave facility line-of-sight communication interference, coordination with the Northern Border Pipeline Company will occur during the determination of specific wind turbine locations. Wind turbines will be sited so they will not interfere with exciting line-of-sight communications.

32) Construction staging areas and pulling and tensioning sites shall be located adjacent to roads where practical. Coordination with landowners will be conducted to establish construction areas (such as conductor pulling and splicing areas and construction yards) on non-agricultural land or in areas with less sensitive crops, where feasible. Construction sites will be maintained in a sanitary condition at all times; waste materials at those sites will be disposed of promptly at an appropriate waste disposal site. “Waste” refers to all discarded matter, including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.

33) During project construction, it will be necessary to remove cattle from areas where blasting or heavy equipment operations are taking place. Arrangements will be made with landowners and livestock owners to keep livestock out of these areas during those periods.

34) A stipulation will be included in easement agreements with landowners along the right-of-way that landowners and/or farmers and ranchers will be reimbursed for the value of the crops lost and the cost of any delay or interruption in necessary farming or grazing practices as a result of any interrupted use of cropland or grazing land.

35) Construction operations will avoid, to the extent feasible, disturbance of agricultural soil during the wet season (moist soil is generally more susceptible to compaction than dry soil). The use of heavy equipment on agricultural land will be minimized to avoid soil compaction.

36) Placing tower structures at the edge of fields where canals or irrigation ditches are located will be avoided.

37) Landowners will be consulted to determine which aerial applicators cover agricultural lands within the vicinity of the wind farm and approved transmission line route. Written notification will be provided to aerial applicators when MET towers, wind turbines and the 230kV transmission line and tower structures will be erected. Aerial applicators will also be provided with maps clearly showing the location of the MET towers, wind turbines and the 230kV transmission line and tower structures.

38) During the right-of-way acquisition process, coordination with each affected landowner will be conducted in order to: 1) develop an alignment within DEQ’s approved 500-foot-wide location

for the line and specific tower locations; 2) to provide clear information about the right-of-way acquisition process compensation and construction and maintenance activities; and 3) to understand landowner plans for use of the transmission corridor area in order to minimize the impact of tower and right-of-way location.

39) Existing roads will be used to the maximum extent possible, but only if in safe and environmentally sound locations. New access roads will be designed and constructed to the appropriate standard no higher than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Abandoned roads and roads that are no longer needed will be re-contoured and re-vegetated.

40) Prior to the start of construction, a traffic management plan to will be submitted to MDOT, Glendive District and Valley County. The plan would direct and obligate the contractor to implement procedures that would minimize traffic impacts. Routing of construction traffic will be coordinated with MDOT and the Valley County Road Administrator

41) Oversize or overweight vehicles will comply with applicable State and county requirements, as permitted or required by MDOT and Valley County.

42) Notice to landowners will be provided when construction takes place to help minimize access disruptions.

43) Proper road signs and warnings will be used.

44) When slow or oversized wide loads are in transit to and from work areas, advance signs and traffic diversion equipment will be used to improve traffic safety. Pilot cars will be used as MDOT dictates depending on load size and weight. Permits would be obtained for these oversized or overweight loads as required by MDOT and Valley County.

45) Carpooling for the construction workforce will be encouraged to reduce traffic volume.

46) In consultation with MDOT and Valley County, detour plans and warning signs will be provided in advance of any traffic disturbances.

47) Flaggers would be employed as necessary to direct traffic when large equipment is exiting or entering public roads to minimize risk of accidents.

48) Project personnel and contractors would be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types, and site-specific conditions to ensure safe and efficient traffic flow.

49) During construction and operation, traffic would be restricted to the roads developed for the project. Use of other unimproved roads would be restricted to emergency situations.

50) Following construction, or during construction as necessary to maintain safe driving conditions, any damage to existing roadways caused by construction vehicles would be adequately repaired. Repairs will be coordinated with MDOT or Valley County.

51) Prior to construction of the 230kV transmission line and prior to subsequent maintenance or removal which would require excavation or earth moving activity on Burlington Northern Santa Fe Railway (BNSF) property, BNSF's Communication Network Control Center will be telephoned to assist in determining if fiber optic, communications, control systems or other types

of cable are buried anywhere on the premises; and if so, Wind Hunter would contact the telecommunications company(ies) involved and make arrangements for protection of the fiber optic cable prior to beginning any work on BNSF property.

52) Prior to construction of the transmission line, coordination with beekeepers would occur to minimize potential environmental impacts, and to mitigate general disruption by the construction activities.

Project Mitigation Commitment

Specifically for the transmission line, Wind Hunter commits the following mitigation plan to reduce unwanted access into the northern portion of the transmission line, to minimize land use conflicts with agricultural lands, and to reduce visual impacts.

Single Pole and Narrower Right of Way

Wind Hunter commits to using single wood or tubular steel poles (corten finish) on the common Link 4 for Routes A and C from milepost 4.1 at the route crossing of Highway 2 to milepost 9.2 near the Antelope Creek Substation (see Figure 2.3-4).

Access Control

Wind Hunter would not cross Buggy Creek (Link 1, milepost 3.5) of both Routes A and C with construction access. An existing access road from Kerr Cow Camp will be used to access the west side of Buggy Creek, and Cornwell Road will be used to access the east side of Buggy Creek. No access across the creek will eliminate unwanted crossing of Buggy Creek and discourage more frequent access than occurs under existing conditions.

Avoid Private Land

On Link 4 between mileposts 0.7 and 1.8, DEQ requested a change in the alignment (shared by Routes A and C) to avoid a parcel of private land. MFSA requires that transmission lines avoid private land where feasible. The adjusted alignment would avoid 4,100 feet of private land and would cross U.S. Highway 2 farther north than the original alignment.

Avoid Cultivated Land

On Link 1 between mileposts 1.1 and 4.4, DEQ requested a change in the alignment (shared by Routes A and C) to avoid two parcels of private cultivated land. MFSA requires that transmission lines avoid cultivated land where feasible. The adjusted alignment would avoid 1,750 feet of cultivated land and instead extend through rangeland southwest of the original alignment.

APPENDIX B
Acronyms & Glossary

ACRONYMS

AC	Alternating Current
ACEC	Area of Critical Environmental Concern
ACSR	Aluminum Conductor Steel Reinforced
AGL	Above Ground Level
AMP	Allotment Management Plan
APLIC	Avian Power Line Interaction Committee
ARPA	Archaeological Resources Protection Act
AUM	Animal Unit Month
BA	Biological Assessment
BACT	Best Available Control Technology
BC	British Columbia
BCWSA	Bitter Creek Wilderness Study Area
BE	Biological Evaluation
BLM	Bureau of Land Management
BMP	Best Management Practice
BNSF	Burlington Northern and Santa Fe Railroad
BO	Biological Opinion
BOR	United States Bureau of Reclamation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CO	Carbon Monoxide
CPI	Consumer Price Index
CRABS	Cultural Resource Annotated Bibliography System
CRIS	Cultural Resource Information System
CRP	Conservation Reserve Program
CRUP	Cultural Resource Use Permit
CWA	Clean Water Act
dB	Decibel
dB(A)	Average A-weighted Decibel
DC	Direct Current
DEQ	Montana Department of Environmental Quality
DNRC	Montana Department of Natural Resources and Conservation
DOE	United States Department of Energy
DOL	United States Department of Labor
DOQQ	Digital Orthophoto Quarter Quadrangle
EA	Environmental Assessment
EFSEC	Washington State Energy Facility Site Evaluation Council
EIA	Energy Information Administration
EIS	Environmental Impact Statement

EMF	Electromagnetic Fields
EMI	Electromagnetic Interference
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FICA	Federal Insurance Contribution Act
FIRM	Flood Insurance Rate Map
FLPMA	Federal Land Policy and Management Act of 1976
FONSI	Finding of No Significant Impact
FPPA	Federal Farmland Protection Act
FSA	Farm Service Agency
FTE	Full-Time Equivalent
G	Gauss
GIS	Geographic Information System
GPR	Ground Potential Rise
HAP	Hazardous Air Pollutants
HAZMAT	Hazardous Materials
HPTP	Historic Properties Treatment Plan
IEEE	Institute of Electrical and Electronic Engineers
IMPLAN	Impact For Planning Model
IO	Input-Output
Kb	Bearpaw Shale
Kcl	Claggett Shale
Kcmil	Thousand Circular Mils Diameter
Kjr	Judith River Formation
kV	Kilovolt
kV/m	Kilovolt per meter
kW	Kilowatt
kWH	Kilowatt Hour
L_{dn}	Day-Night Average Sound Level
L_{eq}	Equivalent Steady State Sound Level
LLC	Limited Liability Corporation
m	Meter
$\mu g/m^3$	Micrograms Per Cubic Meter
µT	MicroTesla
mA	Milliamperes
mg/m^3	Milligrams per Cubic Meter
mG	MilliGauss
Ma	Million Years Ago

MAAQS	Montana Ambient Air Quality Standards
MAP	Mitigation Action Plan
MARCO	Montana Aviation Research Company
MBMG	Montana Bureau of Mines and Geology
MBOGC	Montana Board of Oil and Gas Conservation
MCA	Montana Code Annotated
MDOT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MET	Meteorological
MFSA	Montana Major Facility Siting Act
MFWP	Montana Department of Fish, Wildlife and Parks
MHS	Montana Historical Society
MNHP	Montana Natural Heritage Program
MOA	Military Operations Area
MP	Milepost
MPH	Miles per Hour
MTR	Military Training Route
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NED	National Elevation Dataset
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act
NERC	North American Reliability Council
NPDES	National Pollution Discharge Elimination System
NESC	National Electrical Safety Code
NHPA	National Historic Preservation Act
$N0_2$	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NRIS	National Register Information System
NRIS	Montana Natural Resources Information System
NWCC	National Wind Coordinating Committee
NWI	National Wetlands Inventory
NWPCC	Northwest Power and Conservation Council
NWE	NorthWestern Energy
NWR	National Wildlife Refuge
0_3	Ozone

O & M	Operations and Maintenance
OAQPS	EPA Office of Air Quality Planning and Standards
OHV	Off-Highway Vehicles
OSHA	Occupational Safety and Health Administration
PAB	Palustrine Aquatic Bed Wetland
Pb	Lead
PEIS	Programmatic Environmental Impact Statement
PEM	Palustrine Emergent Wetland
PL	Public Law
PM	Particulate Matter
POD	Plan of Development
POL	Petroleum, Oils, and Lubricants
PPM	Parts per Million
PPT	Parts per Trillion
PTC	Production Tax Credit
PUS	Palustrine Unconsolidated Shore Wetland
Qal	Holocene Alluvium
Qsg/Qac/Qg	Quaternary Deposits
RI	Radio Interference
RPS	Renewables Portfolio Standard
ROD	Record of Decision
ROW	Right-of-Way
RMP	Resource Management Plan
RN	Radio Noise
RPM	Revolutions Per Minute
RSA	Rotor Sweep Area
SF6	Sulfur Hexafluoride
SHPO	State Historic Preservation Office
SPPC	Spill Prevention and Pollution Control
SO_2	Sulfur Dioxide
STIP	Montana Statewide Transportation Improvement Program
SWPPP	Storm Water Pollution Prevention Plan
T&E	Threatened and Endangered
TCP	Traditional Cultural Property
TSA	Transmission Service Agreement
Tsg/Tf	Flaxville Formation
TSP	Total Suspended Particulate
TVI	Television Interference
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of the Interior

USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
V	Volt
V/m	Volts per Meter
VAWT	Vertical Axis Wind Turbine
VCWEP	Valley County Wind Energy Project
VOC	Volatile Organic Compounds
VRM	Visual Resource Management
WAPA	Western Area Power Administration
WECC	Western Electricity Coordinating Council
WECO	Wind Energy in Cold Climates
WMA	Wildlife Management Area
WSA	Wilderness Study Area

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GLOSSARY

100-year floodplain: An area of land that would be inundated by a flood having a one percent chance of occurring in any given year.

Affected environment: Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action.

Attenuation: The reduction in level of sound.

Badland: A region with clay and/or shale substrate where erosion has created highly dissected topography and narrow ravines.

Best Management Practices (BMPs): Methods, measures, or practices that are designed and implemented to prevent or minimize adverse environmental impacts resulting from an action. BMPs include, but are not limited to, structural and nonstructural controls, operation and maintenance procedures, micrositing, and project scheduling. BMPs are determined on the basis of existing environmental conditions and political, economic, and technical feasibility.

BLM Wind Energy Development PEIS: A Final Programmatic Environmental Impact Statement (2005) that evaluates potential wind energy development on BLM lands throughout an 11-state region.

Biological Assessment: A document that evaluates whether an action proposed by a Federal agency is likely to adversely affect listed species, proposed species, or designated critical habitat pursuant to Section 7 of the Endangered Species Act (ESA).

Candidate species: Plants and animals for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened pursuant to the ESA, but for which listing is precluded by higher priority species.

Capacitance: The ability of a substance to store electric charge.

Clean Water Act (CWA): This act requires National Pollutant Discharge Elimination System (NPDES) permits for discharges of effluents to surface waters, permits for storm-water discharges related to industrial activity, and notification of oil discharges to navigable waters of the United States.

Code of Federal Regulations (CFR): A compilation of the general and permanent rules published in the *Federal Register* by the executive departments and agencies of the United States (also referred to as the United States Code or "USC").

Council on Environmental Quality (CEQ): Regulations (40 CFR Parts 1500-1508) that describe the process for implementing NEPA, including preparation of environmental assessments and environmental impact statements, and the timing and extent of public participation.

Cultural resources: The physical remains of human activity, including archaeological sites, architectural structures or features, traditional use areas, and Native American sacred sites or special use areas that provide evidence of the prehistory and history of a community.

Cumulative effect: Environmental effects that result from the incremental impact of a proposed action in addition to other actions (past, present, or reasonably foreseeable future) in the vicinity. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Dead End Structures: Transmission towers that equalize stresses on the conductors because of changes in direction or unusually long spans.

Decibel (dB): A standard unit for measuring the loudness or intensity of sound. In general, a sound doubles in loudness with every increase of 10 decibels.

Decommissioning: All activities necessary to take out of service and dispose of a facility at the conclusion of its functional life.

Direct impact: An effect that results solely from the construction or operation of a proposed action.

Ecoregion: A geographically distinct area of land that is characterized by a distinctive climate, ecological features, and plant and animal communities.

Endangered species: Any species (plant or animal) that is in danger of extinction throughout all or a significant part of its range.

Endangered Species Act (ESA): This act requires consultation with the USFWS and/or NOAA Fisheries to determine if an action will adversely affect an endangered or threatened species or its habitat.

Environmental effect: Any change that an action may cause in the environment, including biological resources, land use, health and socioeconomic conditions, cultural heritage, geology, and paleontology.

Environmental Justice: Evaluation of potential disproportionately high and adverse impacts on low-income and/or minority populations that may result from a proposed action.

Erosion: Wearing away of soil and rock by weathering and the actions of surface water, wind, and underground water.

Farmland of Statewide Importance: Land that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. Criteria for defining and delineating this land are to be determined by the appropriate State agency or agencies. Generally, additional farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods.

Federal Land Policy and Management Act of 1976 (FLPMA): Public Law 94-579, often referred to as the "Organic Act," provides the majority of the BLM's legislated authority, direction, policy and basic management guidance.

Federal listed species: Plant and animal species listed by the USFWS pursuant to the Endangered Species Act.

Foreground: The area of the view in which the viewer is a direct participant, and where features can be distinguished with clarity not possible in the middle ground and background.

Fragmentation: Process by which a single large habitat area is subdivided into smaller units, with these remaining units smaller and farther apart from each other.

Fugitive dust: A particulate emission made airborne by forces of wind, human activity, or both. Unpaved roads, construction sites, and tilled land are examples of areas that originate fugitive dust.

Hazardous material: Any material that poses a threat to human health and/or the environment. Hazardous materials are typically toxic, corrosive, ignitable, explosive, or chemically reactive.

Herbaceous: Annual or perennial plants that do not produce woody stems or branches (i.e., grasses and forbs).

Hub: The central portion of the rotor to which the blades are attached.

Ice throw: An event that occurs when rotating rotors "throw" ice that has accumulated.

Indirect impact: An effect that is related to but removed from a proposed action by an intermediate step or process.

Infrastructure: The basic facilities, services, and utilities needed for the functions of an industrial facility. Examples of infrastructure for wind farms are access roads, transmission lines, meteorological towers, etc.

Lek: A traditional site that is used year after year by male grouse for communal display as they compete for mates.

Megawatt (MW): The electrical unit of power that equals 1 million watts or 1,000 kilowatts.

Montana Major Facilities Siting Act (MFSA): This law governs the siting of most large energy producing, converting and transporting facilities in Montana.

Mitigation measures: Actions taken to avoid, minimize, rectify, or compensate for any adverse environmental impacts.

Nacelle: The housing that protects the major components (e.g., generator and gear box) of a wind turbine.

National Environmental Policy Act of 1969 (NEPA): This act requires Federal agencies to evaluate the environmental effects of proposed actions.

National Historic Preservation Act of 1996, as Amended (NHPA): This act requires Federal agencies to take into account the effects of their actions on cultural resources and consider opportunities to minimize their impacts.

No Action Alternative: The No Action Alternative is required by regulations implementing the NEPA. The No Action Alternative provides a baseline for estimating the effects of other alternatives. Where a project activity is being evaluated, the No Action Alternative is defined as one where no action or activity would take place.

Noxious weed: A plant species designated by Federal or State law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or nonnative, new, or not common to the United States.

Off-Highway Vehicles (OHV): Any motorized vehicle designed for or capable of cross-country travel over land, water, sand, or snow.

Operating reserve: Operating reserves consists of online (spinning) and quick-start (non-spinning) reserves generating capacity which can rapidly pick-up large blocks of electrical load, if needed.

Paleontological resources: Any remains, trace, or imprint of a plant or animal that has been preserved in the earth's crust since some past geologic time.

Palustrine: Inland wetland that lacks flowing water and contains less than 0.05% ocean-derived salts.

Physiography: The physical geography of an area or the description of its physical features.

Plateau: A large, flat area of land that is higher than the surrounding land.

Prime Farmland: Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods.

Production tax credit (PTC): A Federal policy that promotes the development of renewable energy.

Raptor: Bird of prey, such as the eagle, falcon, hawk, owl, or vulture.

Reactance: Opposition to the flow of alternating current.

Resource Management Plan (RMP): A plan that establishes guidance, objectives, policies, and management actions for public lands administered by the BLM.

Right-of-way (ROW): An easement for a certain purpose over the land of another, such as a strip of land used for a transmission line, roadway, or pipeline.

Riparian Habitat: An area directly influenced by water with characteristic vegetation and/or physical features.

Rotor: The portion of a wind turbine that interacts with the wind. It is composed of the blades and the hub to which the blades are attached.

Sedimentation: The removal, transport, and deposition of sediment particles by wind or water.

Sensitive species: A plant or animal species of concern to the BLM due to declining populations or habitats.

Spinning reserve service: Available on-line operating generating capacity above the expected peak load.

Stormwater Pollution Prevention Plan (SWPPP): A project-specific plan developed to minimize runoff of pollutants and sediments.

Substation: A facility with transformers where transmission line voltage is changed.

Tangent structures: Transmission towers designed to support conductors along a nearly straight line with only small turns or angles.

Threatened species: Any plant or animal species listed by the USFWS that is likely to become an endangered species within the foreseeable future.

Traditional Cultural Property: A property that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that are rooted in that community's history and important in maintaining the continuing cultural identity of the community.

Transformer: A device for transferring electric power from one circuit to another in an alternating current system. Transformers are also used to change voltage from one level to another.

Transmission line: The structures, insulators, conductors, and other equipment used to transfer electrical power from one point to another.

Visual contrast: The composite of landform, vegetation, and structure used to evaluate the potential effects of a project on the visual character of an area.

Visual Resource Management (VRM) Classes: A classification used by the BLM. Management classes are determined on the basis of overall scenic quality, distance from travel routes, and sensitivity to change.

> **Class I:** Provides primarily for natural ecological changes only. It is applied to wilderness areas, some natural areas, and similar situations where management activities are to be restricted.
>
> **Class II:** Changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but the changes should remain subordinate to the visual strength of the existing character.
>
> **Class III:** Changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but the changes should remain subordinate to the visual strength of the existing character.
>
> **Class IV:** Changes may subordinate the original composition and character but must reflect what could be a natural occurrence within the characteristic landscape.

Voltage flicker: A noticeable dimming of a light source for a fraction of a second (flicker) caused by a sudden dip in voltage.

Wetland: An area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas.

Wilderness Study Area (WSA): Areas designated by a Federal land management agency as having wilderness characteristics, thus making them worthy of consideration by Congress for wilderness designation.

Wind farm: One or more wind turbines operating within a contiguous area for the purpose of generating electricity.

Xeric: Dry or low in moisture.

Yaw: Side-to-side movement. For wind turbines, it refers to the angle between the axis of the rotor shaft and the wind direction. As this angle increases, the turbine's ability to capture the wind's energy decreases.

APPENDIX C
Noxious Weed and
Invasive Plant Control Plan

Valley County Wind Energy Project

Noxious Weed and Invasive Plant Control Plan

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Table 1-1 Designated Noxious Weeds of Montana C-1

1.0 Introduction

This plan was developed to identify noxious weed and invasive plant control practices that would be implemented for the Valley County Wind Energy Project (VCWEP). Equipment and supplies necessary for construction and future operation and maintenance (O&M) activities, and the activities themselves, are possible agents for the spread of noxious and invasive plants (Sheley and others, 1999). Construction and maintenance vehicles can potentially carry seeds into the project area, and from one part of the area to another. The risk of establishing a weed and invasive plant community increases with ground disturbing maintenance activities (Sheley and others, 1999).

Executive Order 13112 requires that each federal agency 1) prevent the introduction and spread of invasive species, 2) detect and respond rapidly to control such species, 3) monitor invasive species populations, and 4) provide for restoration of native species and habitat conditions in ecosystems that have been invaded (USFR 1999). The Montana County Weed Control Act (Title 7, Chapter 22 Part 21) provides for weed management at the county level. The law requires counties to develop a long-term management plan for the control of noxious weeds in their county. The Montana Major Facility Siting Act (MFSA) preempts all other state and local laws and ordinances, and this weed control plan satisfies MFSA requirements to minimize impacts associated with construction of the 230kV transmission line. A noxious weed list for the Valley County and the State of Montana is presented in Table 1-1.

Table 1-1 Designated Noxious Weeds of Montana

Common Name	Latin Name	Category*	Known to Occur In/Near the Project Area (X)
Canada thistle	*Cirsium arvense*	1	X
Common crupina	*Crupina vulgaris*	3	
Common tansy	*Tanacetum vulgare*	1	
Dalmatian toadflax	*Linaria dalmatica*	1	
Diffuse knapweed	*Centaurea diffusa*	1	
Dyer's woad	*Isatis tinctoria*	2	
Eurasian watermilfoil	*Myriophyllum spicatum*	3	
Field bindweed	*Convolvulus arvensis*	1	X
Houndstongue	*Cynoglossum officinale*	1	
Leafy spurge	*Euphorbia esula*	1	X
Meadow hawkweed complex	*Hieracium pratense, H. floribundum, H. piloselloides*	2	
Orange hawkweed	*Hieracium aurantiacum*	2	
Oxeye daisy	*Chrysanthemum leucanthemum*	1	
Perennial pepperweed	*Lepidium latifolium*	2	
Purple loosestrife	*Lythrum salicaria, L. virgatum*	2	
Rush skeletonweed	*Chondrilla juncea*	3	
Russian knapweed	*Centaurea repens*	1	
Salt cedar	*Tamarix ramosissima, T. chinensis*	2	
Spotted knapweed	*Centaurea maculosa*	1	X
St. Johnswort	*Hypericum perforatum*	1	
Sulfur cinquefoil	*Potentilla recta*	1	

Common Name	Latin Name	Category*	Known to Occur In/Near the Project Area (X)
Tall buttercup	*Ranunculus acris*	2	
Tansy ragwort	*Senecio jacobaea*	2	
Whitetop complex	*Cardaria draba, C. pubescens, C. chalapensis*	1	
Yellow starthistle	*Centaurea solstitialis*	3	
Yellow toadflax	*Linaria vulgaris*	1	
Yellowflag iris	*Iris pseudoacorus*	3	

*Categories:

1: Noxious weeds currently established and generally widespread in many counties of Montana. These weeds are capable of rapid spread and render land unfit or greatly limit beneficial uses.

2: Noxious weeds which have been recently introduced to the state or are rapidly spreading from their current infestation sites. These weeds are capable of rapid spread and invasion of lands, rendering lands unfit for beneficial uses.

3: Noxious weeds which have not been detected in the state or which may be found only in small, scattered, localized infestations. These weeds are known pests in nearby states and are capable of rapid spread and render land unfit for beneficial uses.

Source: Montana Department of Agriculture, 2005.

2.0 Plan Purpose

The purpose of this plan is to prescribe and control the spread of noxious weeds and invasive plants during and following construction of the proposed project. Wind Hunter and its contractors will be responsible for carrying out the methods described in this plan.

The Noxious Weed and Invasive Plant Control Plan will reduce the opportunity for weeds and invasive plants to invade new areas and will minimize their spread within the project area. This strategy will be developed in coordination with BLM, DEQ, and the Valley County Weed District. The focus of Wind Hunter's noxious weed and invasive plant control efforts will be to prevent the spread of new populations resulting from project activities, and to assist landowners in their weed control responsibilities by reducing or eliminating existing infestations in the project area. Without concurrent control of weed infestations by landowners on surrounding lands, weed control efforts in the project area by Wind Hunter will be likely be unsuccessful.

3.0 Objectives

For the project area, the objectives of noxious weed and invasive plant control are: 1) to acquire information on the occurrence, distribution and abundance of noxious weeds and invasive plants in the project area prior to construction, 2) to reduce or eliminate existing infestations and prevent the spread of new and existing populations of noxious weeds and invasive plants within the project area for a period of five years following each construction phase and revegetation activity, or longer as designated by agencies, 3) to ensure any populations of rare plants within the project area are not negatively impacted by control activities, and 4) to coordinate and consult with designated BLM, DEQ, and Valley County personnel regarding all noxious weed control activities conducted by Wind Hunter within the project area to ensure compatibility with existing weed control protocol.

4.0 Weed Control Area

The area for noxious weed and invasive plant control (hereafter referred to as the 'weed control area') includes all lands disturbed by construction activities plus a 50-foot buffer area around disturbances. Roadways are expected to be about 14 feet wide with varying widths of cut and fill

slopes. To buffer all disturbed areas it is estimated that the 'weed control area' will consist of about a 100-foot corridor along all roadways and tensioning sites that are used for construction, and all lands within 50 feet of each new transmission line structure and wind turbines. Wind Hunter will assume responsibility to control noxious and invasive plants in the weed control area.

5.0 Pre-Construction Surveys

Noxious weed and invasive plant inventories in the project area will be conducted by Wind Hunter-designated botanists who are familiar with the taxonomic characteristics and typical habitat preferences of noxious weeds and invasive plants. Prior to each phase of construction, surveys will be conducted along existing and proposed new roads and areas that will otherwise be disturbed to be used for the project, structure locations, pulling and tensioning sites, staging and laydown areas, excavated sites, and other construction sites along the ROW. The Project area will be divided into small survey units (e.g., one or more segments between transmission structures, including transmission structure locations) and botanists will record and map all noxious weed and invasive species present within the survey unit.

Relative abundance and location (using a GPS) of each noxious weed and invasive plant will be recorded for the following three zones (including travelways in and out of the three zones):

- Zone 1: Immediately on the existing or proposed disturbed sites (e.g., roadbeds, structure locations, cut/fill slopes);
- Zone 2: within 50 feet of disturbances, and
- Zone 3: in the general area greater than 50 feet from disturbances.

Ground surveys will be conducted in Zones 1 and 2; Zone 3 will receive a reconnaissance-level survey based on what is visible adjacent to the 50 ft buffer. Relative abundance of noxious and invasive plant species found in surveyed areas will be recorded. The project botanist will identify locations of any rare plant species that could potentially be affected by control activities and identify conditions necessary to avoid adverse impacts to these locations.

The location and abundance data for each noxious weed and invasive plant species encountered during the survey will be provided to BLM, DNRC, and the Valley County Weed District. Maps illustrating noxious weed and invasive species abundances in survey units will be produced at an appropriate scale to assist with monitoring and control activities. Other ancillary thematic layers will also be plotted on the maps to assist with navigation and planning.

The dates of all pre-construction surveys will be coordinated with designated BLM and Valley County personnel. It is Wind Hunter's intent to conduct the survey at an appropriate time in the growing season to positively identify targeted noxious weeds and invasive species and to establish baseline conditions for future control activities. It is anticipated that the first future pre-construction survey will occur in spring 2007.

6.0 Noxious Weed Management

Weeds and invasive species are spread by a variety of means including humans (e.g., workers, hikers and recreationalists, etc.), vehicles, construction equipment, construction and reclamation materials, livestock, and wildlife. Implementation of preventive measures to control the spread of noxious weeds and invasive plants is the most cost-effective management approach.

7.0 Preventive Measures

The following preventive measures would be implemented to prevent the spread of noxious/invasive plants during construction and future O&M activities:

1. Survey vehicles will be cleaned prior to entering the area. Prior to construction, the construction contractor will be trained on methods for cleaning equipment, identification of problem plant species in the project area, and procedures to follow when an invasive or noxious weed is located. To assist in identification, the contractor will be supplied with a list and pictures of noxious and invasive species that may exist within the project area.
2. Prior to entering relatively weed-free areas, vehicles and construction equipment will be cleaned (pressure wash) of all mud, dirt, and plant parts. This will be done to remove weed seed that may be attached to this equipment. Washing will only occur at designated sites (i.e., construction yards), that include appropriate containment systems.
3. Equipment, materials, and vehicles will be stored at specified work areas or construction yards. All personal vehicles, sanitary facilities, and staging areas will be confined to a limited number of specified weed-free locations to decrease chances of incidental disturbance and spread of noxious weeds and invasive plants.
4. Disturbed areas will be promptly seeded following completion of construction activities to reduce the potential for the spread and establishment of noxious weeds and invasive plants. Seeding should occur as soon possible following construction and during the optimal time period. Only BLM, DNRC, and DEQ-approved mixtures of certified "weed-free" seed will be used. All other introduced construction materials used for the Proposed Project, such as straw and fill, shall also be weed-free.
5. To limit new or improved accessibility into the area by OHVs and other motorized vehicles, all new access roads undesired or not required for maintenance would be controlled in accordance with management directives of BLM, State of Montana, and private landowners.

8.0 Control Measures

Assuming the project will begin construction in the spring of 2007, Wind Hunter will begin herbicide applications prior to or at the time of construction (e.g., May-June, 2007) to prevent the spread of existing populations found in the designated weed control area. Annual spraying will most likely occur during the months of May and June; however the potential for fall treatment does exist for some species. Annual spraying will continue for a period of five years following each phase of construction and revegetation activities or longer as designated by agencies.

Using the prior years' survey information, annual spraying will be planned by Wind Hunter and coordinated with BLM, DNRC, DEQ and Valley County personnel to insure spraying will be conducted at the proper growing period, during favorable environmental conditions, and will use the appropriate chemicals to control targeted species. The chemicals used must be BLM approved for use on federal land.

Spraying will be conducted using a qualified contractor as deemed appropriate by Wind Hunter and in consultation with designated BLM and Valley County personnel. The applicator used must possess a Montana State Pesticide Applicators License. If possible, Wind Hunter will hire the Valley County Weed District for a two week period to patrol and, where necessary, to spray the wind farm area, access roads, construction area, and transmission line. Rather than broad application, the intent of applying herbicide will be to treat only designated areas.

It is anticipated that most spraying will be conducted using ATV-mounted spray equipment, supported by one or more four-wheel drive pickups equipped with water tanks. Pickups will carry necessary chemicals, fluid pumps, tools, and water to provide a base station for refilling of ATV spray tanks. Spraying infestations within the weed control area will be conducted by ATV, using hand-held spray guns with 25 to 50 foot hoses attached to spray tanks or by using 8 to 12 foot spray booms. The spray booms will be utilized for treating larger areas on roadbeds and on gentle to moderately steep terrain.

Following annual spraying, a monitoring survey will be conducted to verify locations of noxious weeds and invasive plants in the project vicinity. These monitoring surveys are expected to occur in the fall (August-September) and will be conducted using Wind Hunter's-designated botanist personnel in the same manner described for the pre-construction surveys.

9.0 Reporting

Beginning with the winter of 2007 (November 2007 to February 2008), Wind Hunter will prepare and submit a status report to designated BLM, DNRC and Valley County personnel regarding the previous years weed control activities. The winter 2007 report will detail baseline conditions regarding the occurrence, distribution, and abundance of listed species located in the project area, weed control activities accomplished in 2007, and expected activities during 2008. Each subsequent years report will 1) detail the current status of noxious weed and invasive plant occurrence, distribution and abundance, 2) summarize activities conducted in the project area during previous years, and 3) outline projected activities for the following year. This will include timing of surveys, herbicide treatments, amount and types of chemicals applied, and a list of participants and their activities. These reports will continue annually from winter 2007 for five years following each phase of construction and revegetation activities, or longer as designated by agencies. Copies of the reports will be provided to DEQ for activities associated with the construction of the transmission line.

10.0 References

Montana Department of Agriculture. 2005. Montana Noxious Weed List. Montana Dept. of Agriculture, Helena, Montana. Available at http://agr.state.mt.us/weedpest/noxiousweedslist2.asp.

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USFR (U.S. Federal Register). 1999. "Presidential Document, Executive Order 13112. Invasive Species," Federal Register 64:6183-6186.

APPENDIX D
Summary of Wildlife Studies

Valley County Wind Energy Project

Summary of Wildlife Studies Conducted Between September 2004 and November 2005

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INTRODUCTION

This report summarizes the results of the wildlife studies that were conducted for the Valley County Wind Energy project (VCWEP) between September 2004 and November 2005. These studies were conducted pursuant to a wildlife study plan that was developed by the VCWEP Wildlife Advisory Committee in December 2004. The VCWEP Wildlife Advisory Committee is comprised of the following agencies and organizations: Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), Montana Fish, Wildlife & Parks (MFWP), Montana Department of Environmental Quality (MDEQ), Montana Department of Natural Resources and Conservation (DNRC), Western Area Power Administration (WAPA), Western EcoSystems Technology, Inc. (WEST), and POWER Engineers, Inc. (POWER).

There were multiple goals for the wildlife studies. First, these studies were designed to gather information on existing wildlife resources within the study area. The information obtained through these studies will provide the basis for evaluating potential impacts associated with the development of the proposed wind farm. Second, these studies will help identify species of special concern (i.e., raptors, BLM sensitive species, etc.) and important wildlife habitats within the study area. This information will be applied in an adaptive management framework and taken into consideration during final project design. Third, these studies were designed to obtain baseline information on avian habitat use and abundance in the wind farm area. This baseline information will allow comparison of pre- and post-construction characteristics of avian use in the wind farm area, and will facilitate future analyses of wind farm impacts on avian species.

The following presents a general overview of each of the studies completed in 2005. The individual study reports have been submitted to all agencies and organizations that participate on the VCWEP Wildlife Advisory Committee.

I. 2005 WILDLIFE STUDY SUMMARIES

A. Winter Surveys for Greater Sage-Grouse and Sharp-Tailed Grouse

MFWP was scheduled to complete winter grouse surveys in January and February 2005. Due to inadequate snow cover, these surveys were not conducted. In accordance with the wildlife study plan, the winter grouse surveys will be completed in the winter of 2006.

B. Spring Sage-Grouse and Sharp-Tailed Grouse Lek Surveys

MFWP conducted grouse lek surveys within the study area in April and May of 2005. Known leks within the project area were surveyed on two mornings while the remaining time was spent searching for new leks and documenting grouse use of the area. A total of four active sage-grouse leks were located during these surveys. Three of these were previously known leks, and are located more than 5 miles south of the proposed wind farm area. One of these was located within 1 mile of transmission line alternative B, one was located between transmission line alternatives C and E, and one was located adjacent to transmission line alternative D. One new sage-grouse lek was discovered approximately 5 miles west of the proposed wind farm area in the Bitter Creek Wilderness Study Area.

A total of six active sharp-tailed grouse leks were located within the study area, two of which were historic leks and four of which were newly discovered during these surveys. Two leks were located in the northeastern portion of the proposed wind farm area, one was located approximately 1½ miles west of the wind farm area in the Bitter Creek Wilderness Study Area, and three leks were located more than 5 miles south of the wind farm area. Of these three, one was located adjacent to transmission line alternative B while the remaining two were located between transmission line alternatives C and E. Inclement weather conditions during the study period precluded a complete survey of the study area. Portions of the study area not covered in 2005 will be included in the 2006 lek surveys.

MFWP also conducted lek surveys south and west of the Antelope Creek substation as part of a long term lek monitoring program. A total of six active leks were identified in this area, two of which are located within two miles of the substation. The results of these surveys were submitted in a supplemental report entitled Supplement Report for Sage Grouse Leks South of the Milk River.

The results of the 2005 surveys indicate that the wind farm area does not provide quality habitat for greater sage-grouse, and no leks were identified in the area. The presence of sharp-tailed grouse within and adjacent to the wind farm area indicates that this area does provide quality habitat for the species.

C. Big Game Winter Surveys

MFWP conducted aerial big game winter surveys in January 2005. More than 20 hours were spent aerially surveying the entire area except for the southwestern corner. A total of 4,114 animals were observed during these surveys, including 1,828 mule deer, 1,372 white-tailed deer, and 836 pronghorn. Ten (10) sitings of golden eagles occurred during the aerial big game winter survey. Large concentrations of mule deer were found in 4 areas: the Bitter Creek WSA; the narrow divide between Buggy and Canyon Creeks; lower Buggy Creek; and the Cherry Creek hills north of Glasgow. The Bitter Creek concentration area is located west of the proposed wind farm. The lower Buggy Creek concentration area is located between transmission line alternatives C and E. The Cherry Creek hills concentration area is generally located between transmission line alternatives A and B. Although there were no concentrations of big game within the boundaries of the proposed wind farm, previous studies conducted by MFWP identified substantial use of the southern end of the wind farm area by mule deer.

White-tailed deer were concentrated along the Milk River riparian corridor. Pronghorn were concentrated in three areas: the Dry Fork Creek watershed southwest of the wind farm; between transmission line alternatives A and C approximately 5 miles due west of St. Marie; and in the western portion to the east of Britsch Road. Golden eagles were observed throughout the area, with the highest concentrations found in the vicinity of the Cherry Creek hills.

D. Breeding Bird Presence and Habitat Use

WEST conducted a series of bird surveys, including diurnal fixed-point surveys, in-transit avian surveys, and line transect surveys. Diurnal fixed-point surveys collected observation data at 12 circular plots (0.5 mile radius) distributed throughout the proposed wind farm area. Fixed-point surveys were conducted every other week during two periods: September 29, 2004 through October 31, 2004 and April 1, 2005 through October 27, 2005. Thirty minutes were spent at each surveys plot. All detections of birds and other species of interest in and near the study plots were recorded.

In-transit avian surveys involved recording all bird species observed while driving between fixed points and transects.

Line transect surveys were conducted along a 35 transects established in the Phase I and Phase II portions of the proposed wind farm area. Ten transects were also established in the Phase IV portion of the proposed wind farm area to serve as a reference. Transects were 800 meters in length, and were established at a density of approximately 1 transect per 100 acres. Each transect was surveyed three times during the breeding season (first visit: May 18th - June 1st; second visit: June 4th – June 22nd; third visit: July 3rd - July 31st). Breeding birds were surveyed by slowly walking along transects and recording all birds that were observed or heard within 50 meters of the transect line.

Results

A total of 187 fixed-point surveys were conducted during which the biologists recorded 816 individual birds (45 species) within 357 separate groups. The most frequently observed species were western meadowlark, Sprague's pipit, and horned lark, chestnut-collared longspur, and rock pigeon. Sandhill cranes comprised a large proportion of the individuals observed as the result of one large flock that flew over the study area (approximately 1,000 feet above ground level) during the avian surveys. Passerines were the most abundant avian group observed during spring and summer (> 75%). The only upland game bird use occurred in the summer and the fall of 2005, consisting of several groups of sharp-tailed grouse and a few sage grouse. Upland game birds were observed in only 1.7% of the summer surveys and 3.6% of the fall surveys. Waterfowl were only observed during the spring surveys (9.6%).

The most common avian species recorded during in-transit surveys were Sprague's pipit and western meadowlark. Six species, including gadwall, spotted sandpiper, burrowing owl, rough-legged hawk, American robin, and European starling, were observed during in-transit surveys but were not detected during the fixed-point or breeding bird surveys.

A total of 3,297 individuals in 2,440 groups (56 species) were recorded during line transect surveys. The most common group was grassland sparrows, including chestnut-collared longspur, horned lark, Sprague's pipit, western meadowlark, and savannah sparrow. When the data was standardized, use by larger birds was highest for marbled godwit, Wilson's phalarope, and unidentified ducks while use by smaller birds was highest for chestnut-collared longspur, Sprague's pipit, horned lark, western meadowlark and savannah sparrow.

The results of these surveys indicate that the proposed project area represents high quality habitat for a number of grassland passerines, and supports breeding populations of several species considered sensitive by the USFWS, BLM, and/or MFWP including the Sprague's pipit, chestnut-collared longspur, Baird's sparrow, and grasshopper sparrow. Pelicans were also observed on the pond at Kerr Cow Camp during breeding bird surveys.

E. Diurnal Raptor Surveys

WEST conducted diurnal raptor surveys at 12 circular plots (0.5 mile radius) within the study area. Fixed-point surveys were conducted every other week during two periods: September 29, 2004 through October 31, 2004 and April 1, 2005 through October 27, 2005. A total of 187 fixed point surveys were conducted.

In the fall of 2004, the most commonly observed raptors included bald eagle, northern harrier, merlin, golden eagle, and red-tailed hawk. Only the bald eagle, northern harrier, and merlin were observed in more than five percent of the surveys during this period. In the spring of 2005, the northern harrier and red-tailed hawk were the most commonly observed raptors, and were the only raptor species observed in more than five percent of the surveys. In the summer of 2005, the most commonly observed species were northern harrier and golden eagle. The northern harrier was the only raptor observed in more than five percent of the surveys during this period. In the fall of 2005, the most commonly observed raptors included the Swainson's hawk, golden eagle, and northern harrier. Only the northern harrier and Swainson's hawk were observed in more than five percent of the surveys. Overall raptor use was similar in all seasons.

As an avian group, raptors were most commonly observed flying at turbine blade heights during these surveys. Raptor use within the proposed project is lower than observed at most existing and proposed wind power projects in the U.S. Raptor mortality has been absent to very low at most newer generation wind plants, and studies have revealed a low correlation between raptor use and raptor mortality at newer generation wind facilities.

F. Evaluation of Bird and Bat Migration in the Wind Farm Area

This study involves the analysis of NEXRAD data to determine whether the proposed wind farm area is located within a major bird and/or bat migration corridor. The NEXRAD analysis is currently being conducted by WEST in consultation with the Radar Ornithology Laboratory at Clemson University. It is anticipated that the data analyses and final report will be completed by February 2006.

G. Swift Fox Surveys

MFWP conducted swift fox surveys in the six townships within and adjacent to the project area. The townships were systematically surveyed using Tomahawk live traps between September 26, 2005 and October 15, 2005. Traps remained in place for five consecutive nights and were checked daily. Additional traps were opportunistically set when optimal habitat or swift fox sign was observed. A total of 80 trap locations were established, and surveys included a total of 383 trap-nights.

Four swift fox (2 adult males, 1 adult female, and 1 juvenile female) were captured at 3 separate locations during these surveys. Two of the capture sites were located approximately 5 miles north of the proposed wind farm area. The third capture site was located along the eastern edge of the proposed wind farm area. Additionally, a pair of swift fox were observed and photographed in the central portion of the wind farm area during bird surveys. The presence of a pair of swift fox, in addition to the capture of a juvenile, indicates that swift fox do inhabit the study area and that successful breeding is likely occurring within this area.

H. Bat Surveys

WEST conducted studies to evaluate bat presence in the wind farm area through the use of ANABAT bat detectors (record and analyze high frequency calls) and mist netting. Bat surveys were conducted from August 21, 2005 through August 25, 2005. ANABAT and mist net locations were determined in consultation with BLM and MFWP. Mist netting was conducted in the Buggy Creek riparian area, and seven ANABAT stations were established throughout the wind farm area.

No bats were caught during mist net surveys. A total of 257 bat calls were recorded by the ANABAT units. Most calls (255) were recorded at stations in the vicinity Forsman Reservoir and Buggy Creek. The remaining five ANABAT stations, which were located on higher ridges and along the edge of the Bitter Creek WSA, detected only two calls. Species identified from the recordings included big brown bat (*Eptiscus fuscus*) as well as *Lasiurus* spp. and *Myotis*. spp. It is not known whether the myotis species includes the BLM sensitive long-eared myotis.

I. Habitat Mapping

A map of general habitat types within the study area and a 5-mile buffer around the wind farm was prepared. The mapping process included several steps. First, high resolution digital photographs (DOQ's) of the study area were obtained and printed on maps by POWER. These maps were then taken in the field by WEST technicians, who drove throughout the entire area and delineated the habitat types on these maps. The marked-up maps were then returned to POWER, where they were subsequently digitized and converted into a GIS format. The final GIS habitat type map was produced at a scale of 1:50,000.

The study plan called for the delineation of seven major habitat types (grassland, upland shrub, riparian shrub, riparian forest, "badland", silver sage, and other). However, the results of the field work indicated that more categories were necessary to more accurately define the habitat types within the study area. As a result, the final GIS map delineates 13 habitat types. These include agriculture, disturbed, eroded breaks, grassland with little or no silver sage, grassland with moderate silver sage, silver sage, riparian

forest, riparian shrub and silver sage (where silver sage communities occurs on benches and slopes adjacent to the riparian zone), riparian willow, upland shrub, urban, and water.

J. Post-Construction Monitoring of Avian and Bat Mortality

Post-construction monitoring will begin once the turbines associated with Phase I of the proposed wind farm are operational. A formal monitoring program will be designed in coordination with the VCWEP Wildlife Committee. The primary goals of this program include documenting bird and bat fatalities, estimating annual avian and bat fatalities attributable to the wind farm, evaluating spatial and temporal patterns of fatalities, and using the monitoring data in an adaptive framework during the design of future wind farm phases.

K. Raptor Nest Surveys

WEST conducted raptor nest surveys via helicopter on May 4, 2005. All potential raptor nesting habitats within the proposed wind farm area and a 2-mile buffer around this area were surveyed for active and inactive raptor nests. A total of 12 nest structures were found, two of which were active. These included an above ground ferruginous hawk nest along the western slope of Buggy Creek and a red-tailed hawk nest located in the upper Canyon Creek watershed.

Of the 10 inactive nest structures found during the aerial surveys, five were likely constructed by ferruginous hawks, two by red-tailed hawks, one by a Swainson's hawk, one by a golden eagle, and one by either a Swainson's hawk or red-tailed hawk. Four of these inactive nests were located along the rim on the western edge of the wind farm area, three were in the extreme southern portion of the wind farm area, and three were more than two miles from the wind farm area.

L. BLM Species of Concern

Numerous BLM species of concern were observed and recorded within the study area during the wildlife studies. These include the northern leopard frog, swift fox, burrowing owl, ferruginous hawk, golden eagle, greater sage-grouse, loggerhead shrike, long-billed curlew, chestnut-collared longspur, McCown's longspur, marbled godwit, Baird's sparrow, Brewer's sparrow, Sprague's pipit, Swainson's hawk, willet, and Wilson's phalarope. The number of grassland bird species of concern that were observed in the study area indicates that the area provides a high quality, highly functioning grassland habitat.

II. 2006 WILDLIFE STUDIES

The Wildlife Study Plan for the Valley County Wind Energy Project identifies several studies that will be conducted in 2006. These include winter grouse surveys, spring lek surveys, breeding bird surveys, and swift fox surveys. The specific details of the 2006 studies will be determined at a meeting of the VCWEP Wildlife Committee in January 2006.

APPENDIX E
DEQ
Environmental Specifications

DEQ Environmental Specifications

The following specifications have been developed by the DEQ for projects receiving a Certificate of Compliance and would become conditions to the Certificate of Compliance if it is approved.

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DEFINITIONS

ACCESS EASEMENT: Any land area over which the OWNER has received an easement or other permission from a LANDOWNER allowing travel to and from the project. Access easements may or may not include access roads.

ACCESS ROAD: Any travel course which is constructed by substantial recontouring of land and which is intended to permit passage by most four-wheeled vehicles.

BEGINNING OF CONSTRUCTION: Any project-related earthmoving or removal of vegetation (except for clearing of survey lines).

BOND: Performance bond to guarantee successful reclamation and revegetation of the project as allowed under 75-20-302(2),MCA

CERTIFICATE: Certificate of Compliance issued by the Department of Environmental Quality.

CONTRACTOR: Constructors of the Facility (agent of owner)

DFWP: Montana Department of Fish, Wildlife, and Parks

DNRC: Montana Department of Natural Resources and Conservation

DOT: Montana Department of Transportation

DEQ: Montana Department of Environmental Quality

LANDOWNER: The owner of private property or the managing agency for public lands.

OWNER: The owner(s) of the facility, or the owner's agent.

SENSITIVE AREA: Area which exhibits environmental characteristics that may make it susceptible to impact from construction of a transmission facility. The extent of these areas is defined for each project but may include any of the areas listed in Circular MFSA-2 Sections 3.2(1)(d) and 3.4(1).

SHPO: State Historic Preservation Office

STATE INSPECTOR: DEQ employee or DEQ designee with the responsibility for monitoring the OWNER's and contractor's compliance with terms and conditions of the Certificate of Compliance issued for a project.

PREFACE

For any transmission facility approved by the Montana Department of Environmental Quality (DEQ), a set of environmental specifications must be developed jointly by the applicant and DEQ and included in the Certificate of Compliance.

For a specific project, draft language for those environmental specifications which apply to the entire project is developed prior to publication of the draft environmental document. This language is then subject to public review in the environmental document, revised for the final document, and approved by DEQ at the time of location approval. Site-specific measures, which cannot be specified until after detailed design study, must be appended prior to start of construction.

The purpose of this document is to provide a checklist and suggested language for non-site-specific environmental specifications (items 0.0 though 5.0), and a checklist of types of site-specific data that typically need to be worked out during facility approval (Appendices A through Q). This approach can greatly facilitate the preparation of a project-specific set of environmental specifications for DEQ approval. This document has been written to include suggested language for most environmental specifications typically employed to mitigate impacts of transmission lines of all voltages above 100kV. These specifications are those that DEQ has found necessary to ensure environmental protection during construction and operation of transmission facilities. Language has been worded to be suitable for most projects, but it is anticipated that certain minor modifications will be needed to accommodate a specific project of a certain voltage located in a certain portion of the state. Additional measures may be added as a result of public and agency involvement. It is intended that this document will be used as the starting point for discussions between the applicant and DEQ in preparing a final set of environmental specifications to be included in the Certificate on a specific project.

A number of site-specific attachments (Appendices A through Q) are listed herein. It is intended that the language for these attachments will be worked out jointly by DEQ and the applicant prior to the start of construction. The site-specific attachments required for a given project may differ considerably from project to project.

It should be emphasized that this document is a suggested starting point for discussion. It has no legal standing and imposes no requirements upon an applicant. Legal standing comes when a revised version of this document is approved by DEQ for a specific project certified under MFSA.

INTRODUCTION

The purpose of these specifications is to ensure mitigation of potential environmental impacts during the construction, operation and maintenance of a transmission facility. These specifications are intended to be incorporated into the texts of contract plans and specifications.

For non-exempt facilities, the Montana Major Facility Siting Act supersedes all state and local environmental permit requirements except for those dealing with air and water quality, public health and safety, water appropriations and diversions, and easements across state lands (75-20-103 and 401, MCA). A major purpose of these conditions is to ensure that the intent of the laws which are superseded is met, even though the procedures of applying for and obtaining permits from various state agencies are not. As specified later in this document, the STATE INSPECTOR will have the responsibility for arranging reviews and inspections by other state agencies, which would otherwise have been done through a permit application process.

Appendices A through Q refer to the site-specific concerns and areas that apply for a specific project. These addenda, as needed, will be prepared by DEQ working in consultation with the OWNER prior to the start of construction.

0.0 GENERAL SPECIFICATIONS

0.1. SCOPE

These specifications apply to all lands affected by the project. Where the LANDOWNER requests practices other than those listed in these specifications, the OWNER may authorize such a change provided that the STATE

INSPECTOR is notified in writing of the change and that the change would not be in violation of: (1) the intent of any state law which is superseded by the Montana Major Facility Siting Act; (2) the Certificate; (3) any conditions imposed by DEQ; (4) DEQ's finding of minimum adverse impact; or (5) the regulations in ARM 17.20.1901 and 17.20.1902.

0.2. ENVIRONMENTAL PROTECTION

The OWNER shall conduct all operations in a manner to protect the quality of the environment and to reduce impacts to the greatest extent practical.

0.3. CONTRACT DOCUMENTS

These specifications shall be part of or incorporated into the contract documents; therefore, the OWNER and the OWNER'S agents shall be held responsible for adherence to these specifications in performing the work

0.4. BRIEFING OF EMPLOYEES

The OWNER shall ensure that the CONTRACTOR and all field supervisors are provided with a copy of these specifications and informed of which sections are applicable to specific procedures. It is the responsibility of the OWNER, its CONTRACTOR and the CONTRACTOR's Construction Supervisors to ensure that the intent of these measures is met. Supervisors shall inform all employees on the applicable environmental constraints spelled out herein prior to and during construction. Site-specific measures spelled out in the appendices attached hereto shall be incorporated into the design and construction specifications or other appropriate contract document.

0.5. COMPLIANCE WITH REGULATIONS

All project-related activities of the OWNER shall comply with all applicable local, state, and federal laws, regulations, and requirements.

0.6. LIMITS OF LIABILITY

The OWNER is not responsible for correction of environmental damage or destruction of property caused by negligent acts of DEQ employees during construction monitoring activities.

0.7. DESIGNATION OF SENSITIVE AREAS

DEQ, in its evaluation of the project, has designated certain areas along the right-of-way or access roads as SENSITIVE AREAS. The OWNER shall take all reasonable actions to avoid adverse impacts in these SENSITIVE AREAS.

0.8. PERFORMANCE BOND

To ensure compliance with these specifications, the OWNER shall submit to the State of Montana or its authorized agent a BOND or BONDS pertaining specifically to the restoration of the right-of-way and adjacent land damaged during construction and revegetation. Post-construction monitoring by DEQ will determine compliance with these specifications and other mitigating measures included herein. At the time cleanup and restoration are complete, and revegetation is progressing satisfactorily, the OWNER shall be released from its obligation for restoration. At the time the OWNER is released, a portion of this BOND or a separate BOND shall be established by the OWNER and submitted to the State of Montana or its authorized agent. This BOND shall be held for five years or until monitoring by DEQ indicates that reclamation and road closures have been adequate. The amount and bonding mechanisms for this section shall be specified by DEQ and agreed to by the OWNER under provisions established by 17.20.1902(9) as specified in Appendix B and attached. Proof of bond shall be submitted to DEQ two weeks prior to the start of construction.

0.9. DESIGNATION OF STRUCTURES

Each structure for the project shall be designated by a unique number on plan and profile maps, and a shape file, route, or geodatabase showing line, structure, and access locations submitted to DEQ. References to specific poles or towers in Appendices A through Q shall use these numbers. If this information is not available because the survey is not complete, station numbers or mileposts shall indicate locations along the centerline. Station numbers or mileposts of all angle points shall be designated on plan and profile maps.

0.10. ACCESS

When easements for construction access are obtained for construction personnel, provision will be made by the OWNER to ensure that DEQ personnel or contractors will be allowed access to the right-of-way and to any off-right-of-way access roads used for construction during the term of the CERTIFICATE. Liability for damage caused by providing such access for the STATE INSPECTOR shall be limited by section 0.6 LIMITS OF LIABILITY.

0.11. DESIGNATION OF STATE INSPECTOR

DEQ shall designate a STATE INSPECTOR or INSPECTORS to monitor the OWNER'S compliance with these specifications and any other project–specific mitigation measures adopted by DEQ as provided in ARM 17.20.1901 through 17.20.1902. The STATE INSPECTOR shall be the OWNER's liaison with the State of Montana on construction, post-construction, and reclamation activities. All communications regarding the project shall be directed to the STATE INSPECTOR. The name of the STATE INSPECTOR can be obtained by contacting the Bureau Chief of the Environmental Management Bureau, Permitting and Compliance Division, Department of Environmental Quality, or the Bureau Chief's successor.

1.0. PRE-CONSTRUCTION PLANNING AND COORDINATION

1.1. PLANNING

1.1.1. Planning of all stages of construction and maintenance activities is essential to ensure that construction-related impacts will be kept to a minimum. The CONTRACTOR and OWNER shall, to the extent possible, plan the timing of construction, construction and maintenance access and requirements, location of special use sites, and other details before the commencement of construction.

1.1.2. Preferably thirty days, but at least fifteen days before the start of construction, the OWNER shall submit plan and profile map(s) or electronic equivalent acceptable to the STATE INSPECTOR depicting the location of the centerline and of all construction access roads, maintenance access roads, structures, clearing backlines, and, if known, special use sites. The scale of the map for special use sites shall be 1:24,000 or larger.

1.1.3. If special use sites are not known at the time of submission of the plan and profile, the following information shall be submitted no later than five days prior to the start of construction. The location of special use sites including staging sites, pulling sites, batch plant sites, splicing sites, borrow pits, and storage or other buildings shall be plotted on one of the following and submitted to DEQ: ortho-photomosaics of a scale 1:24,000 or larger, or available USGS 7.5' plan and profile maps of a scale 1:24,000 or larger, or an electronic equivalent acceptable to the STATE INSPECTOR.

1.1.4. Changes or updates to the information submitted in 1.1.2 and 1.1.3 shall be submitted to DEQ as they become available. In no case shall a change be submitted less than five (5) days prior to its anticipated date of construction. Changes in these locations prior to construction where designated SENSITIVE AREAS are affected must be submitted to DEQ seven (7) days before construction and approved by the STATE INSPECTOR prior to construction.

1.1.5. Long-term maintenance routes to all points on the line should be planned before construction begins. Where known, new construction access roads intended to be maintained for permanent use shall be differentiated from temporary access roads on the maps required under 1.1.2 above.

1.2. PRE-CONSTRUCTION CONFERENCE

1.2.1. At least one week before commencement of any construction activities, the OWNER shall schedule a pre-construction conference. The STATE INSPECTOR shall be notified of the date and location for this meeting. One of the purposes of this conference shall be to brief the CONTRACTOR and land management agencies regarding the content of these specifications and other DEQ approved mitigating measures, and to make all parties aware of the roles of the STATE INSPECTOR and of the federal inspectors (if any).

1.2.2. The OWNER's representative, the CONTRACTOR's representative, the STATE INSPECTOR, and representatives of affected state and federal agencies who have land management or permit and easement responsibilities shall be invited to attend the pre-construction conference.

1.3. PUBLIC CONTACT

1.3.1. Written notification by the OWNER's field representative or the CONTRACTOR shall be given to local public officials in each affected community prior to the beginning of construction to provide information on the temporary increase in population, when the increase is expected, and where the workers will be stationed. If local officials require further information, the OWNER shall hold meetings to discuss potential temporary changes. Officials contacted shall include the county commissioners, city administrators, and law enforcement officials. It is also suggested that local fire departments, emergency service providers, and a representative of the Chamber of Commerce be contacted.

1.3.2. The OWNER shall negotiate with the LANDOWNER in determining the best location for access easements and the need for gates.

1.3.3. The OWNER shall contact local government officials, or the managing agency, as appropriate, regarding implementation of required traffic safety measures.

1.4. HISTORICAL AND ARCHAEOLOGICAL SURVEY

1.4.1. The OWNER must develop and carry out a plan approved by the State Historic Preservation Office (SHPO) that includes steps which have been and will be taken to identify, evaluate, and avoid or mitigate damage to cultural resources affected by the project. The plan (Appendix I) shall include: (1) actions taken to identify cultural resources during initial intensive survey work; (2) an evaluation of the significance of the identified sites and likely impacts caused by the project; (3) recommended treatments or measures to avoid or mitigate damage to known cultural sites; (4) steps to be taken in the event other sites are identified after approval of the plan; and (5) provisions for monitoring construction to protect cultural resources. Except for monitoring, all steps of the plan must be carried out prior to the start of construction. The requirements for this plan should not be construed to exempt or alter compliance by the OWNER or managing agency with 36 CFR 800. This plan must be filed with SHPO.

2.0 CONSTRUCTION

2.1. GENERAL

2.1.1. The preservation of the natural landscape contours and environmental features shall be an important consideration in the location of all construction facilities, including roads, storage areas, and buildings. Construction of these facilities shall be planned and conducted so as to minimize destruction, scarring, or defacing of the natural vegetation and landscape. Any necessary earthmoving shall be planned and designed to be as compatible as possible with natural landforms.

2.1.2. Temporary construction sites and staging areas shall be the minimum size necessary to perform the work. Such areas shall be located where most environmentally compatible, considering slope, fragile soils or vegetation, and risk of erosion. After construction, these areas shall be restored as specified in Section 3.0 of these specifications unless the STATE INSPECTOR authorizes a specific exemption in writing.

2.1.3. All work areas shall be maintained in a neat, clean, and sanitary condition at all items. Trash or construction debris (in addition to solid wastes described in section 2.14) shall be regularly removed during the construction and reclamation periods.

2.1.4. In areas where mixing of soil horizons would lead to a significant reduction in soil productivity, increased difficulty in establishing permanent vegetation, or an increase in weeds, mixing of soil horizons shall be avoided insofar as possible. This may be done by removing and stockpiling topsoil, where practical, so that it may be spread over subsoil during site restoration. Known areas where stockpiling of topsoil is required are listed in Appendix L. Prior to construction the STATE INSPECTOR may designate other areas.

2.1.5. Vegetation such as trees, plants, shrubs, and grass on or adjacent to the right-of-way which do not interfere with the performance of construction work or operation of the line itself shall be preserved.

2.1.6. The OWNER shall take all necessary actions to avoid adverse impacts to SENSITIVE AREAS listed in Appendix A. The STATE INSPECTOR shall be notified two working days in advance of initial clearing or construction activity in these areas. The OWNER shall mark or flag the clearing backlines and limits of disturbance in certain SENSITIVE AREAS as designated in Appendix A. All construction activities must be conducted within this marked area.

2.1.7. The OWNER shall either acquire appropriate land rights or provide compensation for damage for the land area that will be disturbed by construction. The width of the area disturbed by construction shall not exceed a reasonable distance from the centerline as necessary to perform the work. For this project, work should be contained within the area specified in Appendix C.

2.1.8. Flow in a stream course may not be permanently diverted. If temporary diversion is necessary, flow will be restored before a major runoff season or the next spawning season, as determined by the STATE INSPECTOR in consultation with the managing agency.

2.2. CONSTRUCTION MONITORING

2.2.1. The STATE INSPECTOR is responsible for implementing the monitoring plan required by ARM 17.20.1902. The plan specifies the type of monitoring data and activities required, and terms and schedules of monitoring data collection, and assigns responsibilities for data collection, inspection reporting, and other monitoring activities. It is attached as Appendix Q.

2.2.2. The STATE INSPECTOR, the OWNER, and the OWNER'S agents will attempt to rely upon a cooperative working relationship to reconcile potential problems relating to construction in SENSITIVE AREAS and compliance with these specifications. When construction activities would cause excessive environmental impacts due to seasonal field conditions or damage to sensitive features, the STATE INSPECTOR will talk with the OWNER about possible mitigating measures or minor construction rescheduling to avoid these impacts. The STATE INSPECTOR will be prepared to provide the OWNER with written documentation of the reasons for the modifications within 24 hours of their imposition.

2.2.3. The STATE INSPECTOR may require mitigating measures or procedures at some sites beyond those listed in Appendix A in order to minimize environmental damage due to unique circumstances that arise during construction, such as unanticipated discovery of a cultural site. The STATE INSPECTOR will follow procedures described in the monitoring plan when such situations arise.

2.2.4. In the event that the STATE INSPECTOR shows reasonable cause that compliance with these specifications is not being achieved, DEQ would take corrective action as described in 75.20.408, MCA.

2.3. TIMING OF CONSTRUCTION

2.3.1. Construction and motorized travel may be restricted or prohibited at certain times of the year in certain areas. Exemptions to these timing restrictions may be granted by DEQ in writing if the OWNER can clearly demonstrate that no environmental impacts will occur as a result. These areas, listed in Appendix D, include areas deemed as SENSITIVE AREAS.

2.3.2. In order to prevent rutting and excessive damage to vegetation, construction will not take place during periods of high soil moisture when construction vehicles will cause severe rutting.

2.4. PUBLIC SAFETY

2.4.1. All construction activities shall be done in compliance with existing health and safety laws.

2.4.2. Requirements for aeronautical hazard marking shall be determined by the OWNER in consultation with the Montana Aeronautical Division, the FAA, and DEQ. These requirements are listed in Appendix E. Where required, aeronautical hazard markings shall be installed at the time the wires are strung, according to the specifications listed in Appendix E.

2.4.3. Noise levels shall not exceed established DEQ standards as a result of operation of the facility and associated facilities. For electric transmission facilities, the average annual noise levels, as expressed by an A-weighted day-night scale (Ldn) will not exceed 50 decibels at the edge of the right-of-way in residential and subdivided areas unless the affected LANDOWNER waives this condition.

2.4.4. The facility shall be designed, constructed, and operated to adhere to the National Electric Safety Codes regarding transmission lines.

2.4.5. The electric field at the edge of the right-of-way will not exceed 1 kilovolt per meter measured 1 meter above the ground in residential or subdivided areas unless the affected LANDOWNER waives this condition, and the electric field at road crossings under the facility will not exceed 7 kilovolts per meter measured 1 meter above the ground.

2.5. PROTECTION OF PROPERTY

2.5.1. Construction operations shall not take place over or upon the right-of-way of any railroad, public road, public trail, or other public property until negotiations and/or necessary approvals have been completed with the managing agency. Designated roads and trails as listed in Appendix A will be protected and kept open for public use. Where it is necessary to cross a trail with access roads, the trail corridor will be restored. Adequate signing and/or blazes will be established so the user can find the route. All roads and trails designated by government agencies as needed for fire protection or other purposes shall be kept free of logs, brush, and debris resulting from operations under this agreement. Any such road or trail damaged by project construction or maintenance shall be promptly restored to its original condition.

2.5.2. Reasonable precautions shall be taken to protect, in place, all public land monuments and private property corners or boundary markers. If any such land markers or monuments are destroyed, the marker shall be reestablished and referenced in accordance with the procedures outlined in the “Manual of Instruction for the Survey of the Public Land of the United States” or, in the case of private property, the specifications of the county engineer. Reestablishment of survey markers will be at the expense of the OWNER

2.5.3. Construction shall be conducted so as to prevent any damage to existing real property including but not limited to transmission lines, distribution lines, telephone lines, railroads, ditches, and public roads crossed. If such property is damaged by operations under this agreement, the OWNER shall repair such damage immediately to a reasonably satisfactory condition in consultation with the property owner.

2.5.4. In areas with livestock, the OWNER shall make a reasonable effort to comply with the reasonable requests of LANDOWNERs regarding measures to control livestock. Unless requested by a LANDOWNER, care shall be taken to ensure that all gates are closed after entry or exit. The LANDOWNER shall be compensated for any losses to personal property due to construction or maintenance activities. Gates shall be inspected and repaired when necessary during construction and missing padlocks shall be replaced. The OWNER shall ensure that gates are not left open at night or during periods of no construction activity unless the LANDOWNER makes other requests. Any fencing or gates cut, removed, damaged, or destroyed by the OWNER shall immediately be replaced with new materials. Fences installed shall be of the same height and general type as a nearby fence on the same property, and shall be stretched tight with a fence stretcher before stapling or securing to the fence post. Temporary gates shall be of sufficiently high quality to withstand repeated opening and closing during construction, to the satisfaction of the

LANDOWNER.

2.5.5. The CONTRACTOR must notify the OWNER, the STATE INSPECTOR, and, if possible, the affected LANDOWNER within two working days of damage to land, crops, property, or irrigation facilities, contamination or degradation of water, or livestock injury caused by the OWNER's construction activities, and the OWNER shall reasonably restore any damaged resource or property or provide reasonable compensation to the affected party.

2.5.6. Pole holes and anchor holes must be covered or fenced in any fields, pastures, or ranges being used for livestock grazing or where a LANDOWNER's requests can be reasonably accommodated.

2.5.7. When requested by the LANDOWNER, all fences crossed by permanent access roads shall be provided with a gate. All fences to be crossed by access roads shall be braced before the fence is cut. Fences not to be gated should be restrung temporarily during construction and restrung permanently within 30 days following construction, subject to the reasonable desires of the LANDOWNER.

2.5.8. Where new access roads cross fence lines, the OWNER shall make reasonable effort to accommodate the LANDOWNER's wishes on gate location and width.

2.5.9. Any breaching of natural barriers to livestock movement by construction activities will require fencing sufficient to control livestock.

2.6. TRAFFIC CONTROL

2.6.1. At least 30 days before any construction within or over any state or federal highway right-of-way or paved secondary highway maintained by DOT, the OWNER will notify the appropriate DOT field office to review the proposed occupancy and to obtain appropriate permits and authorizations. The OWNER must supply DEQ with documentation that this consultation has occurred. This documentation should include any measures recommended by DOT and to what extent the OWNER has agreed to comply with these measures. In the event that recommendations or regulations were not followed, a statement as to why the OWNER chose not to follow them should be included.

2.6.2. In areas where project construction creates a hazard, traffic will be controlled according to the applicable DOT regulations. Safety signs advising motorists of construction equipment shall be placed on major state highways, as recommended by DOT. The installation of proper road signing will be the responsibility of the OWNER.

2.6.3. The managing agency shall be notified, as soon as practicable, when it is necessary to close public roads to public travel for short periods to provide safety during construction.

2.6.4. Construction vehicles and equipment will be operated at speeds safe for existing road and traffic conditions.

2.6.5. Traffic delays will be restricted on primary access routes, as determined by DOT or the managing agency.

2.6.6. Access for fire and emergency vehicles will be provided for at all times.

2.6.7. Public travel through and use of active construction areas shall be limited at the discretion of the managing agency.

2.7. ACCESS ROADS AND VEHICLE MOVEMENT

2.7.1. Construction of new roads shall be the minimum reasonably required to construct and maintain the facility. State, county, and other existing roads shall be used for construction access wherever possible. Access roads intended to be permanent should be initially designed as such. The location of access roads and towers shall be established in consultation with affected LANDOWNERs, and LANDOWNER concerns shall be accommodated where reasonably possible and not in contradiction to these specifications or other DEQ conditions.

2.7.2. All new roads, both temporary and permanent, shall be constructed with the minimum possible clearing and soil disturbance to minimize erosion, as specified in Section 2.11 of these specifications.

2.7.3. Where practical, all roads shall be initially designed to accommodate one-way travel of the largest piece of equipment that will be required to use them; road width shall be no wider than necessary.

2.7.4. Roads shall be located in the right-of-way insofar as possible. Travel outside the right-of-way to enable traffic to avoid cables and conductors during conductor-stringing shall be kept to the minimum possible. Road crossings of the right-of-way should be near support structures.

2.7.5. Where practical, temporary roads shall be constructed on the most level land available. Where temporary roads cross flat land they shall not be graded or bladed unless necessary, but will be flagged or otherwise marked to show their location and to prevent travel off the roadway.

2.7.6. In order to minimize soil disturbance and erosion potential, no cutting and filling for access road construction shall be allowed in areas of up to 5 percent sideslope. In areas of over 5 percent sideslope, road building that may be required shall conform to a 4 percent outslope. The roads shall be constructed to prevent channeling of runoff, and shoulders or berms that would channel runoff shall be avoided.

2.7.7. The OWNER will maintain all permanent access roads, including drainage facilities, which are constructed for use during the period of construction. In the event that a road would be left in place, the OWNER and LANDOWNER may enter into agreements regarding maintenance for erosion control following construction.

2.7.8. Any damage to existing private roads, including rutting, resulting from project construction or maintenance shall be repaired and restored to a condition as good or better than original as soon as possible. Repair and restoration of roads should be accomplished during and following construction as necessary to reduce erosion.

2.7.9. All permanent access road surfaces, including those under construction, will be prepared with the necessary erosion control practices as determined by the STATE INSPECTOR or the managing agency prior to the onset of winter.

2.7.10. Any necessary snow removal shall be done in a manner to preserve and protect roads signs and culverts, to ensure safe and efficient transportation, and to prevent excessive erosion damage to roads, streams, and adjacent land.

2.7.11. At the conclusion of line construction, final maintenance will be performed on all existing private roads used for construction access by the CONTRACTOR. These roads will be returned to a condition as good or better than when construction began.

2.7.12. At least 30 days prior to construction of a new access road approach intersecting a state or federal highway, or of any structure encroaching upon a highway right-of-way, the OWNER shall submit to DOT a plan and profile map showing the location of the proposed construction. At least five days prior to construction, the OWNER shall provide the STATE INSPECTOR written documentation of this consultation and actions to be taken by the OWNER as provided in 2.6.1.

2.8. EQUIPMENT OPERATION

2.8.1. During construction, unauthorized cross-country travel and the development of roads other than those approved shall be prohibited. The OWNER shall be liable for any damage, destruction, or disruption of private property and land caused by his construction personnel and equipment as a result of unauthorized cross-country travel and/or road development.

2.8.2. To prevent excessive soil damage in areas where a graded roadway has not been constructed, the limits and locations of access for construction equipment and vehicles shall be clearly marked or specified at each new site before any equipment is moved to the site. Construction foremen and personnel should be well versed in recognizing these markers and shall understand the restriction on equipment movement that is involved.

2.8.3. Dust control measures shall be implemented on access roads where required by the managing agency or where dust would pose a nuisance to residents. Construction activities and travel shall be conducted to minimize dust. Water, straw, wood chips, dust palliative, gravel, combinations of these, or similar control measures may be used. Oil or similar petroleum-derivatives shall not be used.

2.8.4. Work crew foremen shall be qualified and experienced in the type of work being accomplished by the crew they are supervising. Earthmoving equipment shall be operated only by qualified, experienced personnel. Correction of environmental damage resulting from operation of equipment by inexperienced personnel will be the responsibility of the OWNER. Repair of damage to a condition reasonably satisfactory to the LANDOWNER, managing agency, or if necessary, DEQ, is required.

2.8.5. Sock lines will be strung using methods that minimize disturbance of soils and vegetation.

2.8.6. Following construction in areas designated by the local weed control board or STATE INSPECTOR as a noxious weed area the CONTRACTOR shall thoroughly clean all vehicles and equipment to remove weed parts and seeds immediately prior to leaving the area.

2.9. RIGHT-OF-WAY CLEARING AND SITE PREPARATION

2.9.1. The STATE INSPECTOR shall be notified at least ten days prior to any timber clearing. The STATE INSPECTOR shall be responsible for notifying the DNRC Forestry Division.

2.9.2. During clearing of survey lines or the right-of-way, shrubs shall be preserved to the greatest extent possible. Shrub removal shall be limited to crushing where necessary. Plants may be cut off at ground level, leaving roots undisturbed so that they may re-sprout.

2.9.3. Right-of-way clearing shall be kept to the minimum necessary to meet the requirements of the National Electric Safety Code. Trees to be saved within the clearing backlines and danger trees located outside the clearing backlines shall be marked. Clearing backlines in SENSITIVE AREAS will be indicated on plan and profile maps. All snags and old growth trees that do not endanger the line or maintenance equipment shall be preserved. In designated SENSITIVE AREAS, the STATE INSPECTOR shall approve clearing boundaries prior to clearing.

2.9.4. In no case should the entire nominal width of the right-of-way be cleared of trees up to the edge, unless approved by the STATE INSPECTOR and the LANDOWNER. Clearing should instead produce a “feathered edge” right-of-way configuration, where only specified hazard trees and those that interfere with construction or conductor clearance are removed. In areas where there is potential for long, tunnel views of transmission lines or access roads as identified in Appendix A, care shall be taken to screen the lines from view. For areas identified in Appendix A, a separating screen of vegetation shall be retained where the right-of-way parallels or crosses highways and rivers.

2.9.5. During construction, care will be taken to avoid damage to small trees and shrubs on the right-of-way that do not interfere with the clearing requirements under 2.9.3. and would not grow to create a hazard over a ten-year period.

2.9.6. Soil disturbance and earth moving will be kept to a minimum.

2.9.7. The OWNER shall be held liable for any unauthorized cutting, injury or destruction to timber whether such timber is on or off the right-of-way.

2.9.8. Unless otherwise requested by the LANDOWNER or managing agency, felling shall be directional in order to minimize damage to remaining trees. Maximum stump height shall be no more than 12 inches on the uphill side or 1/3 the tree diameter whichever is greater. Trees will not be pushed or pulled over. Stumps will not be removed unless they conflict with a structure, anchor, or roadway.

2.9.9. Special logging, clearing, or excavation techniques may be required in certain highly sensitive or fragile areas, as listed in Appendix A.

2.9.10. Crane landings shall be constructed on level ground unless extreme conditions (such as soft or marshy ground) make other construction necessary. In areas where more than one crane landing per tower site would be built, the STATE INSPECTOR will be notified at least 5 days prior to the beginning of construction at those sites.

2.9.11. No motorized travel on, scarification of, or displacement of talus slopes shall be allowed except where approved by the STATE INSPECTOR and LANDOWNER.

2.9.12. To avoid unnecessary ground disturbance, grounding wires or counterpoise should be placed or buried in disturbed areas whenever possible.

2.9.13. Slash resulting from project clearing that may be washed out by high water the following spring shall be removed and piled outside the floodplain before runoff. Instream slash resulting from project clearing must be removed within 24 hours.

2.9.14. Streamside trees will be felled away from streams rather than into or across streams.

2.10. GROUNDING

Grounding of fences, buildings, and other structures on and adjacent to the right-of-way shall be done according to the specifications of the National Electric Safety Code and any other specifications listed in Appendix G.

2.11. EROSION AND SEDIMENT CONTROL

2.11.1. Clearing and grubbing for roads and rights-of-way and excavations for stream crossings shall be carefully controlled to minimize silt or other water pollution downstream from the rights-of-way. At a minimum, erosion control measures described in the OWNER's Storm Water Control Plan shall be implemented. Sediment retention basins will be installed as required by the STATE INSPECTOR or managing agency.

2.11.2. Roads shall cross drainage bottoms at sharp or nearly right angles and level with the stream bed whenever possible. Temporary bridges, fords, culverts, or other structures will be installed to avoid stream bank damage.

2.11.3. Under no circumstances shall stream bed materials be removed for use as backfill, embankments, road surfacing, or for other construction purposes.

2.11.4. No excavations shall be allowed on any river or perennial stream channels or floodways at locations likely to cause detrimental erosion or offer a new channel to the river or stream at times of flooding.

2.11.5. Installation of culverts, bridges, or other structures in perennial streams along with clearing on stream beds and banks will be done as specified by the STATE INSPECTOR following on-site inspections with DEQ, DFWP, and local conservation districts. All culverts shall be installed with the culvert inlet and outlet at natural stream grade or ground level.

2.11.6. Construction of access roads, bridges, fill slopes, culverts, or impoundments, or channel changes within the high-water mark of any perennial stream, lake, or pond, requires consultation with DFWP and the local conservation district and application of applicable water quality standards. Within 15 days prior to the start of construction, the OWNER shall submit written documentation that consultation has occurred. Included in this documentation should be the recommendation of the agencies consulted and the actions that OWNER expects to take to completely implement them.

2.11.7. No blasting shall be allowed in streams. Blasting may be allowed near streams if precautions are taken to protect the stream from debris and from entry of nitrates or other contaminants into the stream.

2.11.8. The OWNER shall maintain private roads while using them. All ruts made by machinery shall be filled or graded to prevent channeling. In addition, the OWNER must take measures to prevent the occurrence of erosion caused by wind or water during and after use of these roads. Some erosion-preventive measures include but are not limited to, installing or using cross-logs, drain ditches, water bars, and wind erosion inhibitors such as water, straw, gravel, or combinations of these. Erosion control shall be accomplished as described in the Montana Pollution

Discharge Elimination System (MPDES) General Permit for Storm Water Discharges Associated with Construction Activity.

2.11.9. The OWNER shall prevent material from being deposited in any watercourse or stream channel. Where necessary, measures such as hauling of fill material, construction of temporary barriers, or other approved methods shall be used to keep excavated materials and other extraneous materials out of watercourses. Any such materials entering watercourses shall be removed immediately.

2.11.10. The OWNER shall be responsible for the stability of all embankments created during construction. Embankments and backfills shall contain no stream sediments, frozen material, large roots, sod, or other materials that may reduce their stability.

2.11.11. Culverts, arch bridges, or other stream crossing structures shall be installed at all permanent crossings of flowing or dry watercourses where fill is likely to wash out during the life of the road. Culvert or bridge installation is prohibited in areas of important fish spawning beds identified by DFWP and during specified fish spawning seasons on less sensitive streams or rivers. All culverts shall be large enough to handle approximately 15-year floods. Culvert size shall be determined by standard procedures taking into account the variations in vegetation and climatic zones in Montana, the amount of fill, and the drainage area above the crossing, and shall be approved as specified in 2.11.6. All culverts shall be installed at the time of road construction and maintained for the life of the project. The areas where stream-crossing measures must be taken are listed in Appendix H.

2.11.12. No fill material other than that necessary for road construction shall be piled within the high water zone of streams where floods can transport it directly into the stream. Excess floatable debris shall be removed from areas immediately above crossings to prevent obstruction of culverts or bridges during periods of high water.

2.11.13. No skidding of logs or driving of vehicles across a perennial watercourse shall be allowed, except via authorized construction roads.

2.11.14. No perennial watercourses shall be permanently blocked or diverted.

2.11.15. Skidding with tractors shall not be permitted within 100 feet of streams containing flowing water except in places designated in advance, and in no event shall skid roads be located on these stream courses. Skid trails shall be located high enough out of draws, swales, and valley bottoms to permit diversion of runoff water to natural undisturbed forest ground cover.

2.11.16. Construction methods shall prevent accidental spillage of solid matter, contaminants, debris, petroleum products, and other objectionable pollutants and wastes into watercourses, lakes, and underground water sources. Secondary containment catchment basins capable of containing the maximum accidental spill shall be installed at areas where fuel, chemicals or oil are stored. Any accidental spills of such materials shall be cleaned up immediately.

2.11.17. To reduce the amount of sediment entering streams, a strip of undisturbed vegetation will be provided between areas of disturbance (road construction or tower construction) and stream courses, and around first order or larger streams that have a well-defined stream course or aquatic or riparian vegetation, unless otherwise required by the LANDOWNER. Buffer strip width is measured from the high water line of a channel and will be determined by the STATE INSPECTOR and managing agency. When braided streams with more than one discernible channel (ephemeral or permanent) are encountered, the high water line of the outermost channel shall be used. In the event that vegetation cannot be left undisturbed, structural sediment containment, approved by the STATE INSPECTOR, must be substituted before soil-disturbing activity commences.

2.11.18. When no longer needed, all temporary structures or fill installed to aid stream crossing shall be removed and the course of the stream reestablished to prevent future erosion.

2.11.19. All temporary dams built on the right-of-way shall be removed after line construction unless otherwise approved by the STATE INSPECTOR. Dams allowed to remain shall be upgraded to permanent structures and shall be provided with spillways or culverts, a continuous sod cover on their tops, and downstream slopes meeting dam safety standards. Spillways may be protected against erosion with riprap or equivalent means.

2.11.20. Damage resulting from erosion or other causes shall be repaired after completion of grading and before revegetation is begun.

2.11.21. Point discharge of water will be dispersed in a manner to avoid erosion or sedimentation of streams as required in DEQ permits.

2.11.22. Riprap or other erosion control activities will be planned based on possible downstream consequences of activity, and installed during the low flow season if possible.

2.11.23. Water used in embankment material processing, aggregate processing, concrete curing, foundation and concrete lift cleanup, and other wastewater processes shall not be discharged into surface waters without a valid discharge permit from DEQ.

2.12. ARCHAEOLOGICAL, HISTORICAL AND PALEONTOLOGIC RESOURCES

2.12.1. All construction activities shall be conducted so as to prevent damage to significant archaeological, historical, or paleontologic resources, in accordance with the requirements of 1.4.1 and Appendix I.

2.12.2. Any relics, artifacts, fossils or other items of historical, paleontologic, or archaeological value shall be preserved in a manner acceptable to both the LANDOWNER and the State Historic Preservation Officer. If any such items are discovered during construction, SHPO shall be notified immediately. Work that could disturb the materials or surrounding area must cease until the site can be properly evaluated by a qualified archaeologist (either employed by the OWNER, managing agency or representing SHPO) and recommendations made by that person based on the Historic Preservation Plan outlined in Appendix I (but in no case more than 10 days). For significant sites, the OWNER must follow recommendations of SHPO.

2.12.3. The OWNER shall conform to treatments recommended for cultural resources by either SHPO or the Advisory Council on Historic Preservation (ACHP).

2.13. PREVENTION AND CONTROL OF FIRES

2.13.1. Burning, fire prevention, and fire control shall comply with the burning plan and fire plan in Appendix J. These plans shall meet the requirements of the managing agency and/or the fire control agencies having jurisdiction. The STATE INSPECTOR shall be invited to attend all meetings with these agencies to discuss or prepare these plans. The STATE INSPECTOR, in turn, shall notify DNRC of all such meetings.

2.13.2. The OWNER shall direct the CONTRACTOR to comply with regulations of any county, town, state or governing municipality having jurisdiction regarding fire laws and regulations.

2.13.3. Blasting caps, powder, and other explosives shall be stored only in approved areas and containers and always separate from each other.

2.13.4. The OWNER shall direct the CONTRACTOR to properly store and handle combustible material that could create objectionable smoke, odors, or fumes. The OWNER shall direct the CONTRACTOR not to burn refuse such as trash, rags, tires, plastics, or other debris, except as permitted by the county, town, state, or governing municipality having jurisdiction.

2.14. WASTE DISPOSAL

2.14.1. The OWNER shall direct the CONTRACTOR to use licensed solid waste disposal sites. Inert materials (Group III wastes) may be disposed of at licensed Class III landfill sites; mixed refuse (Group II wastes) must be disposed of at licensed Class II landfill sites.

2.14.2. Emptied pesticide containers or other chemical containers must be triple rinsed to render them acceptable for disposal in Class II landfills or for scrap recycling pursuant to ARM 17.54.201 for treatment or disposal. Pesticide residue and pesticide containers shall be disposed of in accordance with ARM 17.30.637.

2.14.3. All waste materials constituting a hazardous waste defined in ARM 16.44.303, and wastes containing any concentration of polychlorinated biphenyls must be transported to an approved designated hazardous waste management facility (as defined in ARM 17.53.201) for treatment or disposal.

2.14.4. All used oil shall be hauled away and recycled or disposed of in a licensed Class II landfill authorized to accept liquid wastes or in accordance with 2.14.2 and 2.14.3 above. There shall be no intentional release of crankcase oil or other toxic substances into streams or soil. In the event of an accidental spill into a waterway, the substances will be cleaned up and the STATE INSPECTOR will be contacted immediately. Any spill of refined petroleum products greater than 25 gallons must be reported to the State at Disaster and Emergency Services at 406-841-03911.

2.14.5. Sewage shall not be discharged into streams or streambeds. The OWNER shall direct the CONTRACTOR to provide refuse containers and sanitary chemical toilets, convenient to all principal points of operation. These facilities shall comply with applicable federal, state, and local health laws and regulations. A septic tank pump licensed by the State shall service these facilities.

2.14.6. In order to reduce fire hazard, small trees and brush cut during construction should be chipped, burned, and/or scattered. Slash 3 inches in diameter or greater may be scattered in quantities of up to 15 tons/acre unless otherwise requested by the LANDOWNER. Tops, limbs and brush less than 3 inches in diameter and 3 feet in length may be left in quantities less than 3 tons per acre except on cropland and residential land or where otherwise specified by the LANDOWNER. In certain cases the STATE INSPECTOR will authorize chipping and scattering of tops, limbs and brush in excess of 3 tons per acre as an erosion control measure. Merchantable timber should be decked and removed at the direction of the LANDOWNER or managing agency

2.14.7. Refuse burning shall require the prior approval of the LANDOWNER and a Montana Open Burning Permit must be obtained from DEQ. Any burning of wastes shall comply with section 2.13 of these specifications.

2.15. SPECIAL MEASURES

2.15.1. Poles with a low reflectivity constant should be used to reduce potential for visual contrast.

2.15.2. Crossings of rivers should be at right angles. Strategic placement of structures should be done both as a means to screen views of the transmission line and right-of-way and to minimize the need for vegetative clearing.

3.0 POST-CONSTRUCTION CLEANUP AND RECLAMATION

3.1. CLEANUP

3.1.1. All litter resulting from construction is to be removed from the right-of-way and along access roads leading to the right-of-way. Such litter shall be legally disposed of as soon as possible, but in no case later than 60 days following completion of wire clipping. If requested by the LANDOWNER, the OWNER shall provide for removal of any additional construction-related debris discovered after this initial cleanup.

3.1.2. Insofar as practical, all signs of temporary construction facilities such as haul roads, work areas, buildings, foundations or temporary structures, soil stockpiles, excess or waste materials, or any other vestiges of construction shall be removed and the areas restored to as natural a condition as practical, in consultation with the LANDOWNER.

3.2. RESTORATION, RECLAMATION, AND REVEGETATION

3.2.1 Restoration, reclamation, and revegetation of the right-of-way, access roads, crane pads, splicing or stringing sites, borrow sites, gravel fill, stone, or aggregate excavation, or any other disturbance shall be in accordance with the reclamation and revegetation plan (Appendix K). The OWNER may choose to develop this plan in consultation with appropriate land management agencies as part of easement negotiations. In this case, the OWNER shall provide written documentation of consultation with those agencies and a copy of the agreed-to plan. This plan and any conditions to the Certificate approved by DEQ shall be attached as Appendix K.

3.2.2. Scarring or damage to any landscape feature listed in Appendix A shall be restored as nearly as practical to its original condition. Bare areas created by construction activities will be reseeded in compliance with Appendices K and L to prevent soil erosion.

3.2.3. After construction is complete, and in cooperation with the LANDOWNER, temporary roads shall be closed.

3.2.4. In agricultural areas where soil has been compacted by movement of construction equipment and unless otherwise specified by the LANDOWNER, the OWNER shall direct the CONTRACTOR to rip the soil deep enough to restore productivity, or if complete restoration is not possible, the OWNER shall compensate the LANDOWNER for lost productivity.

3.2.5. Earth next to access roads that cross streams shall be replaced at slopes less than the normal angle of repose for the soil type involved.

3.2.6. All drainage channels shall be restored to a gradient and width that will prevent accelerated gully erosion.

3.2.6. Drive-through dips, open-top box culverts, waterbars, or cross drains shall be added to roads at the proper spacing and angle as necessary to prevent erosion.

3.2.7. Interrupted drainage systems shall be restored.

3.2.8. Sidecasting of waste materials may be allowed on slopes over 40 percent after approval by the LANDOWNER, however, this will not be allowed within the buffer strip established for stream courses, in areas of high or extreme soil instability, or in other SENSITIVE AREAS identified in Appendix A. Surplus materials shall be hauled to LANDOWNER-approved sites in such areas.

3.2.9. Seeding prescriptions to be used in revegetation, requirements for hydroseeding, fertilizing, and mulching, as jointly determined by representatives of the OWNER, DEQ, and other involved state and federal agencies, are specified in Appendix L.

3.2.10. Piling and windrowing of material for burning shall use methods that will prevent significant amounts of soil from being included in the material to be burned and minimize destruction of ground cover. Non-mechanized methods are recommended if necessary to minimize soil erosion and vegetation disturbance. Piles shall be located so as to minimize danger to timber and damage to ground cover when burned.

3.2.11. During restoration in areas where topsoil has been stockpiled, the site will be graded to near natural contours and the topsoil will be replaced on the surface.

3.2.12. Excavated material not suitable or required for backfill shall be evenly filled back onto the cleared area prior to spreading any stockpiled soil. Large rocks and boulders uncovered during excavation and not buried in the backfill will be disposed of as approved by the STATE INSPECTOR and/or LANDOWNER.

3.2.13. Application rates and timing of seeds and fertilizer, and purity and germination rates of seed mixtures, shall be as determined in consultation with DEQ. Reseeding shall be done at the first appropriate opportunity after construction ends.

3.2.14. Where appropriate, hydro seeding, drilling, or other appropriate methods shall be used to aid revegetation. Mulching with straw, wood chips, or other means shall be used where necessary. Areas requiring such treatment are listed in Appendix L.

3.2.15. All temporary roads shall be obliterated and reclaimed (with the concurrence of the LANDOWNER), as specified in Appendix M. All temporary roadways shall be graded and scarified as specified to permit the growth of vegetation and to discourage traffic. Permanent unsurfaced roadbeds not open to public use will be revegetated as soon after use as possible unless specified otherwise by the LANDOWNER.

3.3. MONITORING

3.3.1. Upon notice by the OWNER, the STATE INSPECTOR will schedule initial post-construction field inspections following cleanup and road closure. Follow-up visits will be scheduled as required to monitor the effectiveness of erosion controls, reseeding measures, and the right-of-way management plan (Appendix N). The STATE INSPECTOR will contact the LANDOWNER for post-construction access and to determine LANDOWNER satisfaction with the OWNER's restoration measures.

3.3.2. The STATE INSPECTOR shall document observations for inclusion in monitoring reports regarding bond release or the success of mitigating measures required by DEQ.

3.3.2. Failure of the OWNER to adequately reclaim all disturbed areas in accordance with section 3.2 and Appendix K of these specifications shall be cause for forfeiture of the reclamation BOND(s) or penalties described in Section 0.3. Success of revegetation shall be based on criteria specified in the reclamation and revegetation plan (Appendix K). Failure of the OWNER to achieve adequate revegetation of disturbed areas in accordance with Appendix K shall be cause for forfeiture of the revegetation BOND(s) or penalties described in Section 0.3.

4.0. OPERATION AND MAINTENANCE

4.1. RIGHT-OF-WAY MANAGEMENT AND ROAD MAINTENANCE

4.1.1. Maintenance of the right-of-way and permanent access roads shall be as specified in the right-of-way management plan (Appendix N). This plan shall provide for the protection of SENSITIVE AREAS identified prior to and during construction as well as control of erosion on permanent access roads.

4.1.2. Vegetation that has been saved through the construction process and which does not pose a hazard or potential hazard to the transmission line, particularly that of value to fish and wildlife as specified in Appendix A, shall be allowed to grow on the right-of-way.

4.1.3. Vegetative cover adjacent to the transmission line in areas other than cropland shall be maintained in cooperation with the LANDOWNER.

4.1.4. Grass cover, water bars, cross drains, the proper slope, and other agreed to measures shall be maintained on permanent access roads and service roads in order to prevent soil erosion.

4.2. MAINTENANCE INSPECTIONS

4.2.1. The OWNER shall have responsibility to correct soil erosion, noxious weed, or revegetation problems on the right-of-way or access roads as they become known. Appropriate corrective action will be taken where necessary. The OWNER, through agreement with the LANDOWNER or managing agency, may provide a mechanism to identify and correct such problems but the OWNER is responsible for correcting these problems.

4.2.2. Operation and maintenance inspections using ground vehicles shall be timed so that routine maintenance will be done when access roads are firm, dry, or frozen, wherever possible. Maintenance vegetative clearing shall be done according to criteria spelled out in Appendix N.

4.3. CORRECTION OF LANDOWNER PROBLEMS

4.3.1. When the facility causes interference with radio, TV, or other stationary communication systems after the facility is operating, the OWNER will correct the interference with mechanical corrections to facility hardware, or antennas, or will install remote antennas or repeater stations, or will use other reasonable means to correct the problem.

4.3.2. The OWNER will respond to complaints of interference by investigating complaints to determine the origin of the interference. If the interference is not caused by the facility, the OWNER shall so inform the person bringing the complaint. The OWNER shall provide the STATE INSPECTOR with documentation of the evidence regarding the source of the interference if the person brings the complaint to the STATE INSPECTOR or DEQ.

4.4. HERBICIDES AND WEED CONTROL

4.4.1. Weed control, including any application of herbicides in the right-of-way, will be done by applicators currently licensed in Montana and in accordance with recommendations of the Montana Department of Agriculture, and in accordance with the right-of-way maintenance plan in Appendix N.

4.4.2. Herbicides will not be used in certain areas identified by DEQ and DFWP, as listed in Appendix O or as requested by the LANDOWNER.

4.4.3. Proper herbicide application methods will be used to keep drift and nontarget damage to a minimum.

4.4.4. Herbicides must be applied according to label specifications and in accordance with 4.4.1 above. Only herbicides registered in compliance with applicable federal and state laws may be applied.

4.4.5. Herbicides shall not be sprayed during heavy rains or threat of heavy rains. Vegetation buffer zones shall be left along all identifiable stream channels. Herbicides shall not be used in any public water supply watershed identified by DEQ.

4.4.6. In areas disturbed by the transmission line, the OWNER will cooperate with LANDOWNERs in control of noxious weeds as designated by the weed control board having jurisdiction in the county crossed by the line.

4.4.6. The OWNER shall notify the STATE INSPECTOR in writing 30 days prior to any broadcast or aerial spraying of herbicides. The notice shall provide details as to the time, place, and justification for such spraying. DEQ, DFWP, and the Montana Department of Agriculture shall have the opportunity to inspect the portion of the right-of-way or access roads, schedule for such treatment before, during, and after spraying.

4.4.7. During the second and third growing seasons following the completion of restoration and reseeding, the OWNER and STATE INSPECTOR shall inspect the right-of-way and access roads for newly established stands of noxious weeds. The county weed control supervisor shall be invited to attend this inspection. In the event that stands of weeds are encountered, the OWNER shall take appropriate control measures.

4.5. MONITORING

4.5.1. DEQ may continue to monitor operation and maintenance activities for the life of the project in order to ensure compliance with the specifications in this section (see Appendix Q).

4.5.2. The OWNER will be responsible to DEQ for the term of the reclamation BOND (Section 0.8). After this time, the OWNER will report to individual LANDOWNERs and managing agencies except as specified in conditions to the certificate.

4.5.3. Upon reasonable complaint from an affected LANDOWNER or managing agency, DEQ may require the OWNER to fund additional monitoring efforts to resolve problems that develop after release of the BONDs. Such efforts would be limited to determining compliance with these specifications and other conditions of the Certificate.

5.0 ABANDONMENT

When the transmission line is no longer used or useful, structures, conductors, and ground wires shall be removed and disturbed areas reclaimed using methods outlined in Appendix K.

APPENDICES

Appendix A: Sensitive Areas for the Valley County Wind Energy Project 230kV Transmission Line.

The following sensitive areas have been identified for monitoring during construction and reclamation activities:

1. Sensitive areas are: Overhead ground wires shall be marked in the following areas to reduce the potential for avian collisions with the transmission line. As shown on Figure 2.3-4 of the Valley County Wind Energy Project Environmental Assessment:

- Between mileposts 1.7 and 2.0 on Link 3
- Between mileposts 9.6 and 9.8 on Link 3
- Between mileposts 4.7 and 5.2 on Link 4
- Between mileposts 5.7 and 6.0 on Link 4

2. Additional areas for monitoring may be identified following the pre-construction monitoring trip by the State Inspector or the Inspector's designee.

Appendix B: Performance Bond Specifications

_____ construction and reclamation bonds shall be used to ensure performance with these specifications.

Appendix C: Variations In Right-of-Way Width

DEQ does not recommend specific widths for construction easements. In accordance with the specifications, construction activities shall be contained in the minimum area necessary for safe and prudent construction.

DEQ does not recommend specific variations in right-of-way widths beyond those required to meet the National Electric Safety Code for electric transmission line operations and those necessary to meet standards established in ARM 17.20.1607(2).

Appendix D: Areas Where Construction Timing Restrictions Apply

No restrictions in the timing of construction are recommended, beyond those considered necessary on the basis of onsite inspections of stream crossings required in Section 2.11.6 of these specifications and in other sections of these specifications, or as negotiated by LANDOWNERs in individual easement agreements.

Appendix E: Aeronautical Hazard Markings

DEQ does not recommend aeronautical hazard markings at this time. Once the nature of any potential hazard is known, DEQ will consult with the Federal Aviation Administration and Montana Aeronautics Division of DOT to determine appropriate action or aeronautical safety marking.

Appendix F: Noxious Weed Areas

Noxious weed areas will be determined during a joint inspection by the OWNER, affected weed control boards, and LANDOWNERs. Weeds will be controlled as directed by county Noxious Weed Control programs and state law.

Appendix G: Grounding Specifications

Powerlines shall be grounded in accordance with the National Electrical Safety Code.

Appendix H: Culvert and Bridge Requirements

It does not appear that new culverts or bridges will be needed during construction. In the event a culvert or bridge is needed, it shall be installed to the standards set forth in Section 2.11.11 of the specifications.

Appendix I: Historic Preservation Plan

The OWNER, in consultation with SHPO and the National Advisory Council on Historic Preservation, shall develop a plan for identification and treatment of historical or archaeological sites affected by construction. Copies of these plans shall be part of this Appendix. The plan shall identify proposed treatments to be employed to avoid, mitigate or offset project effects on cultural resource sites or culturally significant tribal resources as agreed to by SHPO.

Appendix J: Burning Plan and Fire Plan

The need for a detailed burning or fire plan is not anticipated for this project. In the event that burning is required prior to or during construction, such burning shall occur in accordance with sections 0.5, 2.13, and 2.14 of the specifications.

Appendix K: Reclamation and Revegetation Plan

A reclamation and revegetation plan must be developed and submitted to DEQ for approval. This plan must, at a minimum, specify seeding mixtures, rates, seeding methods and timing of seeding. It must satisfy LANDOWNER wishes, requirements of the MPDES General Permit for Storm Water Discharges Associated with Construction Activity, and ARM 17.20.1902(10).

If a LANDOWNER's management practices prevent the attainment of 90 percent ground cover after five (5) years, revegetation on that land will be deemed adequate when portions of the right-of-way disturbed by construction and temporary roads are reclaimed to a state of usefulness similar to that existing prior to construction.

Appendix L: Areas Where Stockpiling of Topsoil, Hydro Seeding, Fertilizing, or Mulching is Required

Appendix M: Roads to be Closed and/or Obliterated

It does not appear that it will be necessary to build permanent roads for access or maintenance for this project. If such roads are necessary, the OWNER shall close or obliterate the roads as requested by the LANDOWNER.

Appendix N: Right-of-Way Management Plan

DEQ does not recommend a specific right-of-way management plan. To the extent possible, all maintenance and operation activities shall be performed to comply with the requirements of the environmental specifications.

Appendix O: Watersheds and Other Areas Where Herbicides are Prohibited

DEQ does not recommend any areas or watersheds where herbicide use is prohibited. Herbicide use shall conform to all applicable local, state, and federal restrictions.

Appendix P: Name and Address of State Inspector

STATE INSPECTOR	OWNER'S LIAISON
Environmental Science Specialist	
Montana Dept of Environmental Quality	
P.O. Box 200901	
1520 East Sixth Avenue	
Helena, Montana 59620-0901	
(406) 444-_____	

Appendix Q: Monitoring Plan

The STATE INSPECTOR is responsible for implementing this monitoring plan required by 75-20-303(b) and (c), MCA, and for reporting whether terms of the Certificate and Environmental Specifications are being met, along with any conditions in the Stormwater Discharge permit and state land easements. The STATE INSPECTOR may identify additional mitigating measures in order to minimize environmental damage due to unique circumstances that arise during construction. These measures will be presented in writing to the Owner's Liaison who will see that such measures are implemented in a timely manner.

In the growing season following construction the STATE INSPECTOR will determine the adequacy of erosion controls, check for successful seed germination, and determine in conjunction with county weed supervisors areas where weed control would be necessary.

After one and five complete growing seasons following construction, the STATE INSPECTOR will determine whether revegetation efforts have been sufficient to meet the requirements of Appendix K of these Environmental Specifications. If revegetation is not adequate to meet the requirements of Appendix K, the STATE INSPECTOR shall determine whether it is in the best interest of the State to seize the BOND or BONDs and reclaim and revegetate remaining disturbed areas or to continue to monitor these areas. The STATE INSPECTOR shall respond to complaints from citizens for the life of the project.

When violations of the Certificate are identified, the STATE INSPECTOR shall report the violation in writing to the OWNER, who shall immediately take corrective action. If violations continue, civil penalties described in 75-20-408, MCA may be imposed.

DEQ Environmental Specifications

The following specifications have been developed by the DEQ for projects receiving a Certificate of Compliance and would become conditions to the Certificate of Compliance if it is approved.

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DEFINITIONS

ACCESS EASEMENT: Any land area over which the OWNER has received an easement or other permission from a LANDOWNER allowing travel to and from the project. Access easements may or may not include access roads.

ACCESS ROAD: Any travel course which is constructed by substantial recontouring of land and which is intended to permit passage by most four-wheeled vehicles.

BEGINNING OF CONSTRUCTION: Any project-related earthmoving or removal of vegetation (except for clearing of survey lines).

BOND: Performance bond to guarantee successful reclamation and revegetation of the project as allowed under 75-20-302(2),MCA

CERTIFICATE: Certificate of Compliance issued by the Department of Environmental Quality.

CONTRACTOR: Constructors of the Facility (agent of owner)

DFWP: Montana Department of Fish, Wildlife, and Parks

DNRC: Montana Department of Natural Resources and Conservation

DOT: Montana Department of Transportation

DEQ: Montana Department of Environmental Quality

LANDOWNER: The owner of private property or the managing agency for public lands.

OWNER: The owner(s) of the facility, or the owner's agent.

SENSITIVE AREA: Area which exhibits environmental characteristics that may make it susceptible to impact from construction of a transmission facility. The extent of these areas is defined for each project but may include any of the areas listed in Circular MFSA-2 Sections 3.2(1)(d) and 3.4(1).

SHPO: State Historic Preservation Office

STATE INSPECTOR: DEQ employee or DEQ designee with the responsibility for monitoring the OWNER's and contractor's compliance with terms and conditions of the Certificate of Compliance issued for a project.

PREFACE

For any transmission facility approved by the Montana Department of Environmental Quality (DEQ), a set of environmental specifications must be developed jointly by the applicant and DEQ and included in the Certificate of Compliance.

For a specific project, draft language for those environmental specifications which apply to the entire project is developed prior to publication of the draft environmental document. This language is then subject to public review in the environmental document, revised for the final document, and approved by DEQ at the time of location approval. Site-specific measures, which cannot be specified until after detailed design study, must be appended prior to start of construction.

The purpose of this document is to provide a checklist and suggested language for non-site-specific environmental specifications (items 0.0 though 5.0), and a checklist of types of site-specific data that typically need to be worked out during facility approval (Appendices A through Q). This approach can greatly facilitate the preparation of a project-specific set of environmental specifications for DEQ approval. This document has been written to include suggested language for most environmental specifications typically employed to mitigate impacts of transmission lines of all voltages above 100kV. These specifications are those that DEQ has found necessary to ensure environmental protection during construction and operation of transmission facilities. Language has been worded to be suitable for most projects, but it is anticipated that certain minor modifications will be needed to accommodate a specific project of a certain voltage located in a certain portion of the state. Additional measures may be added as a result of public and agency involvement. It is intended that this document will be used as the starting point for discussions between the applicant and DEQ in preparing a final set of environmental specifications to be included in the Certificate on a specific project.

A number of site-specific attachments (Appendices A through Q) are listed herein. It is intended that the language for these attachments will be worked out jointly by DEQ and the applicant prior to the start of construction. The site-specific attachments required for a given project may differ considerably from project to project.

It should be emphasized that this document is a suggested starting point for discussion. It has no legal standing and imposes no requirements upon an applicant. Legal standing comes when a revised version of this document is approved by DEQ for a specific project certified under MFSA.

INTRODUCTION

The purpose of these specifications is to ensure mitigation of potential environmental impacts during the construction, operation and maintenance of a transmission facility. These specifications are intended to be incorporated into the texts of contract plans and specifications.

For non-exempt facilities, the Montana Major Facility Siting Act supersedes all state and local environmental permit requirements except for those dealing with air and water quality, public health and safety, water appropriations and diversions, and easements across state lands (75-20-103 and 401, MCA). A major purpose of these conditions is to ensure that the intent of the laws which are superseded is met, even though the procedures of applying for and obtaining permits from various state agencies are not. As specified later in this document, the STATE INSPECTOR will have the responsibility for arranging reviews and inspections by other state agencies, which would otherwise have been done through a permit application process.

Appendices A through Q refer to the site-specific concerns and areas that apply for a specific project. These addenda, as needed, will be prepared by DEQ working in consultation with the OWNER prior to the start of construction.

0.0 GENERAL SPECIFICATIONS

0.1. SCOPE

These specifications apply to all lands affected by the project. Where the LANDOWNER requests practices other than those listed in these specifications, the OWNER may authorize such a change provided that the STATE

INSPECTOR is notified in writing of the change and that the change would not be in violation of: (1) the intent of any state law which is superseded by the Montana Major Facility Siting Act; (2) the Certificate; (3) any conditions imposed by DEQ; (4) DEQ's finding of minimum adverse impact; or (5) the regulations in ARM 17.20.1901 and 17.20.1902.

0.2. ENVIRONMENTAL PROTECTION

The OWNER shall conduct all operations in a manner to protect the quality of the environment and to reduce impacts to the greatest extent practical.

0.3. CONTRACT DOCUMENTS

These specifications shall be part of or incorporated into the contract documents; therefore, the OWNER and the OWNER'S agents shall be held responsible for adherence to these specifications in performing the work

0.4. BRIEFING OF EMPLOYEES

The OWNER shall ensure that the CONTRACTOR and all field supervisors are provided with a copy of these specifications and informed of which sections are applicable to specific procedures. It is the responsibility of the OWNER, its CONTRACTOR and the CONTRACTOR's Construction Supervisors to ensure that the intent of these measures is met. Supervisors shall inform all employees on the applicable environmental constraints spelled out herein prior to and during construction. Site-specific measures spelled out in the appendices attached hereto shall be incorporated into the design and construction specifications or other appropriate contract document.

0.5. COMPLIANCE WITH REGULATIONS

All project-related activities of the OWNER shall comply with all applicable local, state, and federal laws, regulations, and requirements.

0.6. LIMITS OF LIABILITY

The OWNER is not responsible for correction of environmental damage or destruction of property caused by negligent acts of DEQ employees during construction monitoring activities.

0.7. DESIGNATION OF SENSITIVE AREAS

DEQ, in its evaluation of the project, has designated certain areas along the right-of-way or access roads as SENSITIVE AREAS. The OWNER shall take all reasonable actions to avoid adverse impacts in these SENSITIVE AREAS.

0.8. PERFORMANCE BOND

To ensure compliance with these specifications, the OWNER shall submit to the State of Montana or its authorized agent a BOND or BONDS pertaining specifically to the restoration of the right-of-way and adjacent land damaged during construction and revegetation. Post-construction monitoring by DEQ will determine compliance with these specifications and other mitigating measures included herein. At the time cleanup and restoration are complete, and revegetation is progressing satisfactorily, the OWNER shall be released from its obligation for restoration. At the time the OWNER is released, a portion of this BOND or a separate BOND shall be established by the OWNER and submitted to the State of Montana or its authorized agent. This BOND shall be held for five years or until monitoring by DEQ indicates that reclamation and road closures have been adequate. The amount and bonding mechanisms for this section shall be specified by DEQ and agreed to by the OWNER under provisions established by 17.20.1902(9) as specified in Appendix B and attached. Proof of bond shall be submitted to DEQ two weeks prior to the start of construction.

0.9. DESIGNATION OF STRUCTURES

Each structure for the project shall be designated by a unique number on plan and profile maps, and a shape file, route, or geodatabase showing line, structure, and access locations submitted to DEQ. References to specific poles or towers in Appendices A through Q shall use these numbers. If this information is not available because the survey is not complete, station numbers or mileposts shall indicate locations along the centerline. Station numbers or mileposts of all angle points shall be designated on plan and profile maps.

0.10. ACCESS

When easements for construction access are obtained for construction personnel, provision will be made by the OWNER to ensure that DEQ personnel or contractors will be allowed access to the right-of-way and to any off-right-of-way access roads used for construction during the term of the CERTIFICATE. Liability for damage caused by providing such access for the STATE INSPECTOR shall be limited by section 0.6 LIMITS OF LIABILITY.

0.11. DESIGNATION OF STATE INSPECTOR

DEQ shall designate a STATE INSPECTOR or INSPECTORS to monitor the OWNER'S compliance with these specifications and any other project–specific mitigation measures adopted by DEQ as provided in ARM 17.20.1901 through 17.20.1902. The STATE INSPECTOR shall be the OWNER's liaison with the State of Montana on construction, post-construction, and reclamation activities. All communications regarding the project shall be directed to the STATE INSPECTOR. The name of the STATE INSPECTOR can be obtained by contacting the Bureau Chief of the Environmental Management Bureau, Permitting and Compliance Division, Department of Environmental Quality, or the Bureau Chief's successor.

1.0. PRE-CONSTRUCTION PLANNING AND COORDINATION

1.1. PLANNING

1.1.1. Planning of all stages of construction and maintenance activities is essential to ensure that construction-related impacts will be kept to a minimum. The CONTRACTOR and OWNER shall, to the extent possible, plan the timing of construction, construction and maintenance access and requirements, location of special use sites, and other details before the commencement of construction.

1.1.2. Preferably thirty days, but at least fifteen days before the start of construction, the OWNER shall submit plan and profile map(s) or electronic equivalent acceptable to the STATE INSPECTOR depicting the location of the centerline and of all construction access roads, maintenance access roads, structures, clearing backlines, and, if known, special use sites. The scale of the map for special use sites shall be 1:24,000 or larger.

1.1.3. If special use sites are not known at the time of submission of the plan and profile, the following information shall be submitted no later than five days prior to the start of construction. The location of special use sites including staging sites, pulling sites, batch plant sites, splicing sites, borrow pits, and storage or other buildings shall be plotted on one of the following and submitted to DEQ: ortho-photomosaics of a scale 1:24,000 or larger, or available USGS 7.5' plan and profile maps of a scale 1:24,000 or larger, or an electronic equivalent acceptable to the STATE INSPECTOR.

1.1.4. Changes or updates to the information submitted in 1.1.2 and 1.1.3 shall be submitted to DEQ as they become available. In no case shall a change be submitted less than five (5) days prior to its anticipated date of construction. Changes in these locations prior to construction where designated SENSITIVE AREAS are affected must be submitted to DEQ seven (7) days before construction and approved by the STATE INSPECTOR prior to construction.

1.1.5. Long-term maintenance routes to all points on the line should be planned before construction begins. Where known, new construction access roads intended to be maintained for permanent use shall be differentiated from temporary access roads on the maps required under 1.1.2 above.

1.2. PRE-CONSTRUCTION CONFERENCE

1.2.1. At least one week before commencement of any construction activities, the OWNER shall schedule a pre-construction conference. The STATE INSPECTOR shall be notified of the date and location for this meeting. One of the purposes of this conference shall be to brief the CONTRACTOR and land management agencies regarding the content of these specifications and other DEQ approved mitigating measures, and to make all parties aware of the roles of the STATE INSPECTOR and of the federal inspectors (if any).

1.2.2. The OWNER's representative, the CONTRACTOR's representative, the STATE INSPECTOR, and representatives of affected state and federal agencies who have land management or permit and easement responsibilities shall be invited to attend the pre-construction conference.

1.3. PUBLIC CONTACT

1.3.1. Written notification by the OWNER's field representative or the CONTRACTOR shall be given to local public officials in each affected community prior to the beginning of construction to provide information on the temporary increase in population, when the increase is expected, and where the workers will be stationed. If local officials require further information, the OWNER shall hold meetings to discuss potential temporary changes. Officials contacted shall include the county commissioners, city administrators, and law enforcement officials. It is also suggested that local fire departments, emergency service providers, and a representative of the Chamber of Commerce be contacted.

1.3.2. The OWNER shall negotiate with the LANDOWNER in determining the best location for access easements and the need for gates.

1.3.3. The OWNER shall contact local government officials, or the managing agency, as appropriate, regarding implementation of required traffic safety measures.

1.4. HISTORICAL AND ARCHAEOLOGICAL SURVEY

1.4.1. The OWNER must develop and carry out a plan approved by the State Historic Preservation Office (SHPO) that includes steps which have been and will be taken to identify, evaluate, and avoid or mitigate damage to cultural resources affected by the project. The plan (Appendix I) shall include: (1) actions taken to identify cultural resources during initial intensive survey work; (2) an evaluation of the significance of the identified sites and likely impacts caused by the project; (3) recommended treatments or measures to avoid or mitigate damage to known cultural sites; (4) steps to be taken in the event other sites are identified after approval of the plan; and (5) provisions for monitoring construction to protect cultural resources. Except for monitoring, all steps of the plan must be carried out prior to the start of construction. The requirements for this plan should not be construed to exempt or alter compliance by the OWNER or managing agency with 36 CFR 800. This plan must be filed with SHPO.

2.0 CONSTRUCTION

2.1. GENERAL

2.1.1. The preservation of the natural landscape contours and environmental features shall be an important consideration in the location of all construction facilities, including roads, storage areas, and buildings. Construction of these facilities shall be planned and conducted so as to minimize destruction, scarring, or defacing of the natural vegetation and landscape. Any necessary earthmoving shall be planned and designed to be as compatible as possible with natural landforms.

2.1.2. Temporary construction sites and staging areas shall be the minimum size necessary to perform the work. Such areas shall be located where most environmentally compatible, considering slope, fragile soils or vegetation, and risk of erosion. After construction, these areas shall be restored as specified in Section 3.0 of these specifications unless the STATE INSPECTOR authorizes a specific exemption in writing.

2.1.3. All work areas shall be maintained in a neat, clean, and sanitary condition at all items. Trash or construction debris (in addition to solid wastes described in section 2.14) shall be regularly removed during the construction and reclamation periods.

2.1.4. In areas where mixing of soil horizons would lead to a significant reduction in soil productivity, increased difficulty in establishing permanent vegetation, or an increase in weeds, mixing of soil horizons shall be avoided insofar as possible. This may be done by removing and stockpiling topsoil, where practical, so that it may be spread over subsoil during site restoration. Known areas where stockpiling of topsoil is required are listed in Appendix L. Prior to construction the STATE INSPECTOR may designate other areas.

2.1.5. Vegetation such as trees, plants, shrubs, and grass on or adjacent to the right-of-way which do not interfere with the performance of construction work or operation of the line itself shall be preserved.

2.1.6. The OWNER shall take all necessary actions to avoid adverse impacts to SENSITIVE AREAS listed in Appendix A. The STATE INSPECTOR shall be notified two working days in advance of initial clearing or construction activity in these areas. The OWNER shall mark or flag the clearing backlines and limits of disturbance in certain SENSITIVE AREAS as designated in Appendix A. All construction activities must be conducted within this marked area.

2.1.7. The OWNER shall either acquire appropriate land rights or provide compensation for damage for the land area that will be disturbed by construction. The width of the area disturbed by construction shall not exceed a reasonable distance from the centerline as necessary to perform the work. For this project, work should be contained within the area specified in Appendix C.

2.1.8. Flow in a stream course may not be permanently diverted. If temporary diversion is necessary, flow will be restored before a major runoff season or the next spawning season, as determined by the STATE INSPECTOR in consultation with the managing agency.

2.2. CONSTRUCTION MONITORING

2.2.1. The STATE INSPECTOR is responsible for implementing the monitoring plan required by ARM 17.20.1902. The plan specifies the type of monitoring data and activities required, and terms and schedules of monitoring data collection, and assigns responsibilities for data collection, inspection reporting, and other monitoring activities. It is attached as Appendix Q.

2.2.2. The STATE INSPECTOR, the OWNER, and the OWNER'S agents will attempt to rely upon a cooperative working relationship to reconcile potential problems relating to construction in SENSITIVE AREAS and compliance with these specifications. When construction activities would cause excessive environmental impacts due to seasonal field conditions or damage to sensitive features, the STATE INSPECTOR will talk with the OWNER about possible mitigating measures or minor construction rescheduling to avoid these impacts. The STATE INSPECTOR will be prepared to provide the OWNER with written documentation of the reasons for the modifications within 24 hours of their imposition.

2.2.3. The STATE INSPECTOR may require mitigating measures or procedures at some sites beyond those listed in Appendix A in order to minimize environmental damage due to unique circumstances that arise during construction, such as unanticipated discovery of a cultural site. The STATE INSPECTOR will follow procedures described in the monitoring plan when such situations arise.

2.2.4. In the event that the STATE INSPECTOR shows reasonable cause that compliance with these specifications is not being achieved, DEQ would take corrective action as described in 75.20.408, MCA.

2.3. TIMING OF CONSTRUCTION

2.3.1. Construction and motorized travel may be restricted or prohibited at certain times of the year in certain areas. Exemptions to these timing restrictions may be granted by DEQ in writing if the OWNER can clearly demonstrate that no environmental impacts will occur as a result. These areas, listed in Appendix D, include areas deemed as SENSITIVE AREAS.

2.3.2. In order to prevent rutting and excessive damage to vegetation, construction will not take place during periods of high soil moisture when construction vehicles will cause severe rutting.

2.4. PUBLIC SAFETY

2.4.1. All construction activities shall be done in compliance with existing health and safety laws.

2.4.2. Requirements for aeronautical hazard marking shall be determined by the OWNER in consultation with the Montana Aeronautical Division, the FAA, and DEQ. These requirements are listed in Appendix E. Where required, aeronautical hazard markings shall be installed at the time the wires are strung, according to the specifications listed in Appendix E.

2.4.3. Noise levels shall not exceed established DEQ standards as a result of operation of the facility and associated facilities. For electric transmission facilities, the average annual noise levels, as expressed by an A-weighted day-night scale (Ldn) will not exceed 50 decibels at the edge of the right-of-way in residential and subdivided areas unless the affected LANDOWNER waives this condition.

2.4.4. The facility shall be designed, constructed, and operated to adhere to the National Electric Safety Codes regarding transmission lines.

2.4.5. The electric field at the edge of the right-of-way will not exceed 1 kilovolt per meter measured 1 meter above the ground in residential or subdivided areas unless the affected LANDOWNER waives this condition, and the electric field at road crossings under the facility will not exceed 7 kilovolts per meter measured 1 meter above the ground.

2.5. PROTECTION OF PROPERTY

2.5.1. Construction operations shall not take place over or upon the right-of-way of any railroad, public road, public trail, or other public property until negotiations and/or necessary approvals have been completed with the managing agency. Designated roads and trails as listed in Appendix A will be protected and kept open for public use. Where it is necessary to cross a trail with access roads, the trail corridor will be restored. Adequate signing and/or blazes will be established so the user can find the route. All roads and trails designated by government agencies as needed for fire protection or other purposes shall be kept free of logs, brush, and debris resulting from operations under this agreement. Any such road or trail damaged by project construction or maintenance shall be promptly restored to its original condition.

2.5.2. Reasonable precautions shall be taken to protect, in place, all public land monuments and private property corners or boundary markers. If any such land markers or monuments are destroyed, the marker shall be reestablished and referenced in accordance with the procedures outlined in the “Manual of Instruction for the Survey of the Public Land of the United States” or, in the case of private property, the specifications of the county engineer. Reestablishment of survey markers will be at the expense of the OWNER

2.5.3. Construction shall be conducted so as to prevent any damage to existing real property including but not limited to transmission lines, distribution lines, telephone lines, railroads, ditches, and public roads crossed. If such property is damaged by operations under this agreement, the OWNER shall repair such damage immediately to a reasonably satisfactory condition in consultation with the property owner.

2.5.4. In areas with livestock, the OWNER shall make a reasonable effort to comply with the reasonable requests of LANDOWNERs regarding measures to control livestock. Unless requested by a LANDOWNER, care shall be taken to ensure that all gates are closed after entry or exit. The LANDOWNER shall be compensated for any losses to personal property due to construction or maintenance activities. Gates shall be inspected and repaired when necessary during construction and missing padlocks shall be replaced. The OWNER shall ensure that gates are not left open at night or during periods of no construction activity unless the LANDOWNER makes other requests. Any fencing or gates cut, removed, damaged, or destroyed by the OWNER shall immediately be replaced with new materials. Fences installed shall be of the same height and general type as a nearby fence on the same property, and shall be stretched tight with a fence stretcher before stapling or securing to the fence post. Temporary gates shall be of sufficiently high quality to withstand repeated opening and closing during construction, to the satisfaction of the

LANDOWNER.

2.5.5. The CONTRACTOR must notify the OWNER, the STATE INSPECTOR, and, if possible, the affected LANDOWNER within two working days of damage to land, crops, property, or irrigation facilities, contamination or degradation of water, or livestock injury caused by the OWNER's construction activities, and the OWNER shall reasonably restore any damaged resource or property or provide reasonable compensation to the affected party.

2.5.6. Pole holes and anchor holes must be covered or fenced in any fields, pastures, or ranges being used for livestock grazing or where a LANDOWNER's requests can be reasonably accommodated.

2.5.7. When requested by the LANDOWNER, all fences crossed by permanent access roads shall be provided with a gate. All fences to be crossed by access roads shall be braced before the fence is cut. Fences not to be gated should be restrung temporarily during construction and restrung permanently within 30 days following construction, subject to the reasonable desires of the LANDOWNER.

2.5.8. Where new access roads cross fence lines, the OWNER shall make reasonable effort to accommodate the LANDOWNER's wishes on gate location and width.

2.5.9. Any breaching of natural barriers to livestock movement by construction activities will require fencing sufficient to control livestock.

2.6. TRAFFIC CONTROL

2.6.1. At least 30 days before any construction within or over any state or federal highway right-of-way or paved secondary highway maintained by DOT, the OWNER will notify the appropriate DOT field office to review the proposed occupancy and to obtain appropriate permits and authorizations. The OWNER must supply DEQ with documentation that this consultation has occurred. This documentation should include any measures recommended by DOT and to what extent the OWNER has agreed to comply with these measures. In the event that recommendations or regulations were not followed, a statement as to why the OWNER chose not to follow them should be included.

2.6.2. In areas where project construction creates a hazard, traffic will be controlled according to the applicable DOT regulations. Safety signs advising motorists of construction equipment shall be placed on major state highways, as recommended by DOT. The installation of proper road signing will be the responsibility of the OWNER.

2.6.3. The managing agency shall be notified, as soon as practicable, when it is necessary to close public roads to public travel for short periods to provide safety during construction.

2.6.4. Construction vehicles and equipment will be operated at speeds safe for existing road and traffic conditions.

2.6.5. Traffic delays will be restricted on primary access routes, as determined by DOT or the managing agency.

2.6.6. Access for fire and emergency vehicles will be provided for at all times.

2.6.7. Public travel through and use of active construction areas shall be limited at the discretion of the managing agency.

2.7. ACCESS ROADS AND VEHICLE MOVEMENT

2.7.1. Construction of new roads shall be the minimum reasonably required to construct and maintain the facility. State, county, and other existing roads shall be used for construction access wherever possible. Access roads intended to be permanent should be initially designed as such. The location of access roads and towers shall be established in consultation with affected LANDOWNERs, and LANDOWNER concerns shall be accommodated where reasonably possible and not in contradiction to these specifications or other DEQ conditions.

2.7.2. All new roads, both temporary and permanent, shall be constructed with the minimum possible clearing and soil disturbance to minimize erosion, as specified in Section 2.11 of these specifications.

2.7.3. Where practical, all roads shall be initially designed to accommodate one-way travel of the largest piece of equipment that will be required to use them; road width shall be no wider than necessary.

2.7.4. Roads shall be located in the right-of-way insofar as possible. Travel outside the right-of-way to enable traffic to avoid cables and conductors during conductor-stringing shall be kept to the minimum possible. Road crossings of the right-of-way should be near support structures.

2.7.5. Where practical, temporary roads shall be constructed on the most level land available. Where temporary roads cross flat land they shall not be graded or bladed unless necessary, but will be flagged or otherwise marked to show their location and to prevent travel off the roadway.

2.7.6. In order to minimize soil disturbance and erosion potential, no cutting and filling for access road construction shall be allowed in areas of up to 5 percent sideslope. In areas of over 5 percent sideslope, road building that may be required shall conform to a 4 percent outslope. The roads shall be constructed to prevent channeling of runoff, and shoulders or berms that would channel runoff shall be avoided.

2.7.7. The OWNER will maintain all permanent access roads, including drainage facilities, which are constructed for use during the period of construction. In the event that a road would be left in place, the OWNER and LANDOWNER may enter into agreements regarding maintenance for erosion control following construction.

2.7.8. Any damage to existing private roads, including rutting, resulting from project construction or maintenance shall be repaired and restored to a condition as good or better than original as soon as possible. Repair and restoration of roads should be accomplished during and following construction as necessary to reduce erosion.

2.7.9. All permanent access road surfaces, including those under construction, will be prepared with the necessary erosion control practices as determined by the STATE INSPECTOR or the managing agency prior to the onset of winter.

2.7.10. Any necessary snow removal shall be done in a manner to preserve and protect roads signs and culverts, to ensure safe and efficient transportation, and to prevent excessive erosion damage to roads, streams, and adjacent land.

2.7.11. At the conclusion of line construction, final maintenance will be performed on all existing private roads used for construction access by the CONTRACTOR. These roads will be returned to a condition as good or better than when construction began.

2.7.12. At least 30 days prior to construction of a new access road approach intersecting a state or federal highway, or of any structure encroaching upon a highway right-of-way, the OWNER shall submit to DOT a plan and profile map showing the location of the proposed construction. At least five days prior to construction, the OWNER shall provide the STATE INSPECTOR written documentation of this consultation and actions to be taken by the OWNER as provided in 2.6.1.

2.8. EQUIPMENT OPERATION

2.8.1. During construction, unauthorized cross-country travel and the development of roads other than those approved shall be prohibited. The OWNER shall be liable for any damage, destruction, or disruption of private property and land caused by his construction personnel and equipment as a result of unauthorized cross-country travel and/or road development.

2.8.2. To prevent excessive soil damage in areas where a graded roadway has not been constructed, the limits and locations of access for construction equipment and vehicles shall be clearly marked or specified at each new site before any equipment is moved to the site. Construction foremen and personnel should be well versed in recognizing these markers and shall understand the restriction on equipment movement that is involved.

2.8.3. Dust control measures shall be implemented on access roads where required by the managing agency or where dust would pose a nuisance to residents. Construction activities and travel shall be conducted to minimize dust. Water, straw, wood chips, dust palliative, gravel, combinations of these, or similar control measures may be used. Oil or similar petroleum-derivatives shall not be used.

2.8.4. Work crew foremen shall be qualified and experienced in the type of work being accomplished by the crew they are supervising. Earthmoving equipment shall be operated only by qualified, experienced personnel. Correction of environmental damage resulting from operation of equipment by inexperienced personnel will be the responsibility of the OWNER. Repair of damage to a condition reasonably satisfactory to the LANDOWNER, managing agency, or if necessary, DEQ, is required.

2.8.5. Sock lines will be strung using methods that minimize disturbance of soils and vegetation.

2.8.6. Following construction in areas designated by the local weed control board or STATE INSPECTOR as a noxious weed area the CONTRACTOR shall thoroughly clean all vehicles and equipment to remove weed parts and seeds immediately prior to leaving the area.

2.9. RIGHT-OF-WAY CLEARING AND SITE PREPARATION

2.9.1. The STATE INSPECTOR shall be notified at least ten days prior to any timber clearing. The STATE INSPECTOR shall be responsible for notifying the DNRC Forestry Division.

2.9.2. During clearing of survey lines or the right-of-way, shrubs shall be preserved to the greatest extent possible. Shrub removal shall be limited to crushing where necessary. Plants may be cut off at ground level, leaving roots undisturbed so that they may re-sprout.

2.9.3. Right-of-way clearing shall be kept to the minimum necessary to meet the requirements of the National Electric Safety Code. Trees to be saved within the clearing backlines and danger trees located outside the clearing backlines shall be marked. Clearing backlines in SENSITIVE AREAS will be indicated on plan and profile maps. All snags and old growth trees that do not endanger the line or maintenance equipment shall be preserved. In designated SENSITIVE AREAS, the STATE INSPECTOR shall approve clearing boundaries prior to clearing.

2.9.4. In no case should the entire nominal width of the right-of-way be cleared of trees up to the edge, unless approved by the STATE INSPECTOR and the LANDOWNER. Clearing should instead produce a “feathered edge” right-of-way configuration, where only specified hazard trees and those that interfere with construction or conductor clearance are removed. In areas where there is potential for long, tunnel views of transmission lines or access roads as identified in Appendix A, care shall be taken to screen the lines from view. For areas identified in Appendix A, a separating screen of vegetation shall be retained where the right-of-way parallels or crosses highways and rivers.

2.9.5. During construction, care will be taken to avoid damage to small trees and shrubs on the right-of-way that do not interfere with the clearing requirements under 2.9.3. and would not grow to create a hazard over a ten-year period.

2.9.6. Soil disturbance and earth moving will be kept to a minimum.

2.9.7. The OWNER shall be held liable for any unauthorized cutting, injury or destruction to timber whether such timber is on or off the right-of-way.

2.9.8. Unless otherwise requested by the LANDOWNER or managing agency, felling shall be directional in order to minimize damage to remaining trees. Maximum stump height shall be no more than 12 inches on the uphill side or 1/3 the tree diameter whichever is greater. Trees will not be pushed or pulled over. Stumps will not be removed unless they conflict with a structure, anchor, or roadway.

2.9.9. Special logging, clearing, or excavation techniques may be required in certain highly sensitive or fragile areas, as listed in Appendix A.

2.9.10. Crane landings shall be constructed on level ground unless extreme conditions (such as soft or marshy ground) make other construction necessary. In areas where more than one crane landing per tower site would be built, the STATE INSPECTOR will be notified at least 5 days prior to the beginning of construction at those sites.

2.9.11. No motorized travel on, scarification of, or displacement of talus slopes shall be allowed except where approved by the STATE INSPECTOR and LANDOWNER.

2.9.12. To avoid unnecessary ground disturbance, grounding wires or counterpoise should be placed or buried in disturbed areas whenever possible.

2.9.13. Slash resulting from project clearing that may be washed out by high water the following spring shall be removed and piled outside the floodplain before runoff. Instream slash resulting from project clearing must be removed within 24 hours.

2.9.14. Streamside trees will be felled away from streams rather than into or across streams.

2.10. GROUNDING

Grounding of fences, buildings, and other structures on and adjacent to the right-of-way shall be done according to the specifications of the National Electric Safety Code and any other specifications listed in Appendix G.

2.11. EROSION AND SEDIMENT CONTROL

2.11.1. Clearing and grubbing for roads and rights-of-way and excavations for stream crossings shall be carefully controlled to minimize silt or other water pollution downstream from the rights-of-way. At a minimum, erosion control measures described in the OWNER's Storm Water Control Plan shall be implemented. Sediment retention basins will be installed as required by the STATE INSPECTOR or managing agency.

2.11.2. Roads shall cross drainage bottoms at sharp or nearly right angles and level with the stream bed whenever possible. Temporary bridges, fords, culverts, or other structures will be installed to avoid stream bank damage.

2.11.3. Under no circumstances shall stream bed materials be removed for use as backfill, embankments, road surfacing, or for other construction purposes.

2.11.4. No excavations shall be allowed on any river or perennial stream channels or floodways at locations likely to cause detrimental erosion or offer a new channel to the river or stream at times of flooding.

2.11.5. Installation of culverts, bridges, or other structures in perennial streams along with clearing on stream beds and banks will be done as specified by the STATE INSPECTOR following on-site inspections with DEQ, DFWP, and local conservation districts. All culverts shall be installed with the culvert inlet and outlet at natural stream grade or ground level.

2.11.6. Construction of access roads, bridges, fill slopes, culverts, or impoundments, or channel changes within the high-water mark of any perennial stream, lake, or pond, requires consultation with DFWP and the local conservation district and application of applicable water quality standards. Within 15 days prior to the start of construction, the OWNER shall submit written documentation that consultation has occurred. Included in this documentation should be the recommendation of the agencies consulted and the actions that OWNER expects to take to completely implement them.

2.11.7. No blasting shall be allowed in streams. Blasting may be allowed near streams if precautions are taken to protect the stream from debris and from entry of nitrates or other contaminants into the stream.

2.11.8. The OWNER shall maintain private roads while using them. All ruts made by machinery shall be filled or graded to prevent channeling. In addition, the OWNER must take measures to prevent the occurrence of erosion caused by wind or water during and after use of these roads. Some erosion-preventive measures include but are not limited to, installing or using cross-logs, drain ditches, water bars, and wind erosion inhibitors such as water, straw, gravel, or combinations of these. Erosion control shall be accomplished as described in the Montana Pollution

Discharge Elimination System (MPDES) General Permit for Storm Water Discharges Associated with Construction Activity.

2.11.9. The OWNER shall prevent material from being deposited in any watercourse or stream channel. Where necessary, measures such as hauling of fill material, construction of temporary barriers, or other approved methods shall be used to keep excavated materials and other extraneous materials out of watercourses. Any such materials entering watercourses shall be removed immediately.

2.11.10. The OWNER shall be responsible for the stability of all embankments created during construction. Embankments and backfills shall contain no stream sediments, frozen material, large roots, sod, or other materials that may reduce their stability.

2.11.11. Culverts, arch bridges, or other stream crossing structures shall be installed at all permanent crossings of flowing or dry watercourses where fill is likely to wash out during the life of the road. Culvert or bridge installation is prohibited in areas of important fish spawning beds identified by DFWP and during specified fish spawning seasons on less sensitive streams or rivers. All culverts shall be large enough to handle approximately 15-year floods. Culvert size shall be determined by standard procedures taking into account the variations in vegetation and climatic zones in Montana, the amount of fill, and the drainage area above the crossing, and shall be approved as specified in 2.11.6. All culverts shall be installed at the time of road construction and maintained for the life of the project. The areas where stream-crossing measures must be taken are listed in Appendix H.

2.11.12. No fill material other than that necessary for road construction shall be piled within the high water zone of streams where floods can transport it directly into the stream. Excess floatable debris shall be removed from areas immediately above crossings to prevent obstruction of culverts or bridges during periods of high water.

2.11.13. No skidding of logs or driving of vehicles across a perennial watercourse shall be allowed, except via authorized construction roads.

2.11.14. No perennial watercourses shall be permanently blocked or diverted.

2.11.15. Skidding with tractors shall not be permitted within 100 feet of streams containing flowing water except in places designated in advance, and in no event shall skid roads be located on these stream courses. Skid trails shall be located high enough out of draws, swales, and valley bottoms to permit diversion of runoff water to natural undisturbed forest ground cover.

2.11.16. Construction methods shall prevent accidental spillage of solid matter, contaminants, debris, petroleum products, and other objectionable pollutants and wastes into watercourses, lakes, and underground water sources. Secondary containment catchment basins capable of containing the maximum accidental spill shall be installed at areas where fuel, chemicals or oil are stored. Any accidental spills of such materials shall be cleaned up immediately.

2.11.17. To reduce the amount of sediment entering streams, a strip of undisturbed vegetation will be provided between areas of disturbance (road construction or tower construction) and stream courses, and around first order or larger streams that have a well-defined stream course or aquatic or riparian vegetation, unless otherwise required by the LANDOWNER. Buffer strip width is measured from the high water line of a channel and will be determined by the STATE INSPECTOR and managing agency. When braided streams with more than one discernible channel (ephemeral or permanent) are encountered, the high water line of the outermost channel shall be used. In the event that vegetation cannot be left undisturbed, structural sediment containment, approved by the STATE INSPECTOR, must be substituted before soil-disturbing activity commences.

2.11.18. When no longer needed, all temporary structures or fill installed to aid stream crossing shall be removed and the course of the stream reestablished to prevent future erosion.

2.11.19. All temporary dams built on the right-of-way shall be removed after line construction unless otherwise approved by the STATE INSPECTOR. Dams allowed to remain shall be upgraded to permanent structures and shall be provided with spillways or culverts, a continuous sod cover on their tops, and downstream slopes meeting dam safety standards. Spillways may be protected against erosion with riprap or equivalent means.

2.11.20. Damage resulting from erosion or other causes shall be repaired after completion of grading and before revegetation is begun.

2.11.21. Point discharge of water will be dispersed in a manner to avoid erosion or sedimentation of streams as required in DEQ permits.

2.11.22. Riprap or other erosion control activities will be planned based on possible downstream consequences of activity, and installed during the low flow season if possible.

2.11.23. Water used in embankment material processing, aggregate processing, concrete curing, foundation and concrete lift cleanup, and other wastewater processes shall not be discharged into surface waters without a valid discharge permit from DEQ.

2.12. ARCHAEOLOGICAL, HISTORICAL AND PALEONTOLOGIC RESOURCES

2.12.1. All construction activities shall be conducted so as to prevent damage to significant archaeological, historical, or paleontologic resources, in accordance with the requirements of 1.4.1 and Appendix I.

2.12.2. Any relics, artifacts, fossils or other items of historical, paleontologic, or archaeological value shall be preserved in a manner acceptable to both the LANDOWNER and the State Historic Preservation Officer. If any such items are discovered during construction, SHPO shall be notified immediately. Work that could disturb the materials or surrounding area must cease until the site can be properly evaluated by a qualified archaeologist (either employed by the OWNER, managing agency or representing SHPO) and recommendations made by that person based on the Historic Preservation Plan outlined in Appendix I (but in no case more than 10 days). For significant sites, the OWNER must follow recommendations of SHPO.

2.12.3. The OWNER shall conform to treatments recommended for cultural resources by either SHPO or the Advisory Council on Historic Preservation (ACHP).

2.13. PREVENTION AND CONTROL OF FIRES

2.13.1. Burning, fire prevention, and fire control shall comply with the burning plan and fire plan in Appendix J. These plans shall meet the requirements of the managing agency and/or the fire control agencies having jurisdiction. The STATE INSPECTOR shall be invited to attend all meetings with these agencies to discuss or prepare these plans. The STATE INSPECTOR, in turn, shall notify DNRC of all such meetings.

2.13.2. The OWNER shall direct the CONTRACTOR to comply with regulations of any county, town, state or governing municipality having jurisdiction regarding fire laws and regulations.

2.13.3. Blasting caps, powder, and other explosives shall be stored only in approved areas and containers and always separate from each other.

2.13.4. The OWNER shall direct the CONTRACTOR to properly store and handle combustible material that could create objectionable smoke, odors, or fumes. The OWNER shall direct the CONTRACTOR not to burn refuse such as trash, rags, tires, plastics, or other debris, except as permitted by the county, town, state, or governing municipality having jurisdiction.

2.14. WASTE DISPOSAL

2.14.1. The OWNER shall direct the CONTRACTOR to use licensed solid waste disposal sites. Inert materials (Group III wastes) may be disposed of at licensed Class III landfill sites; mixed refuse (Group II wastes) must be disposed of at licensed Class II landfill sites.

2.14.2. Emptied pesticide containers or other chemical containers must be triple rinsed to render them acceptable for disposal in Class II landfills or for scrap recycling pursuant to ARM 17.54.201 for treatment or disposal. Pesticide residue and pesticide containers shall be disposed of in accordance with ARM 17.30.637.

2.14.3. All waste materials constituting a hazardous waste defined in ARM 16.44.303, and wastes containing any concentration of polychlorinated biphenyls must be transported to an approved designated hazardous waste management facility (as defined in ARM 17.53.201) for treatment or disposal.

2.14.4. All used oil shall be hauled away and recycled or disposed of in a licensed Class II landfill authorized to accept liquid wastes or in accordance with 2.14.2 and 2.14.3 above. There shall be no intentional release of crankcase oil or other toxic substances into streams or soil. In the event of an accidental spill into a waterway, the substances will be cleaned up and the STATE INSPECTOR will be contacted immediately. Any spill of refined petroleum products greater than 25 gallons must be reported to the State at Disaster and Emergency Services at 406-841-03911.

2.14.5. Sewage shall not be discharged into streams or streambeds. The OWNER shall direct the CONTRACTOR to provide refuse containers and sanitary chemical toilets, convenient to all principal points of operation. These facilities shall comply with applicable federal, state, and local health laws and regulations. A septic tank pump licensed by the State shall service these facilities.

2.14.6. In order to reduce fire hazard, small trees and brush cut during construction should be chipped, burned, and/or scattered. Slash 3 inches in diameter or greater may be scattered in quantities of up to 15 tons/acre unless otherwise requested by the LANDOWNER. Tops, limbs and brush less than 3 inches in diameter and 3 feet in length may be left in quantities less than 3 tons per acre except on cropland and residential land or where otherwise specified by the LANDOWNER. In certain cases the STATE INSPECTOR will authorize chipping and scattering of tops, limbs and brush in excess of 3 tons per acre as an erosion control measure. Merchantable timber should be decked and removed at the direction of the LANDOWNER or managing agency

2.14.7. Refuse burning shall require the prior approval of the LANDOWNER and a Montana Open Burning Permit must be obtained from DEQ. Any burning of wastes shall comply with section 2.13 of these specifications.

2.15. SPECIAL MEASURES

2.15.1. Poles with a low reflectivity constant should be used to reduce potential for visual contrast.

2.15.2. Crossings of rivers should be at right angles. Strategic placement of structures should be done both as a means to screen views of the transmission line and right-of-way and to minimize the need for vegetative clearing.

3.0 POST-CONSTRUCTION CLEANUP AND RECLAMATION

3.1. CLEANUP

3.1.1. All litter resulting from construction is to be removed from the right-of-way and along access roads leading to the right-of-way. Such litter shall be legally disposed of as soon as possible, but in no case later than 60 days following completion of wire clipping. If requested by the LANDOWNER, the OWNER shall provide for removal of any additional construction-related debris discovered after this initial cleanup.

3.1.2. Insofar as practical, all signs of temporary construction facilities such as haul roads, work areas, buildings, foundations or temporary structures, soil stockpiles, excess or waste materials, or any other vestiges of construction shall be removed and the areas restored to as natural a condition as practical, in consultation with the LANDOWNER.

3.2. RESTORATION, RECLAMATION, AND REVEGETATION

3.2.1 Restoration, reclamation, and revegetation of the right-of-way, access roads, crane pads, splicing or stringing sites, borrow sites, gravel fill, stone, or aggregate excavation, or any other disturbance shall be in accordance with the reclamation and revegetation plan (Appendix K). The OWNER may choose to develop this plan in consultation with appropriate land management agencies as part of easement negotiations. In this case, the OWNER shall provide written documentation of consultation with those agencies and a copy of the agreed-to plan. This plan and any conditions to the Certificate approved by DEQ shall be attached as Appendix K.

3.2.2. Scarring or damage to any landscape feature listed in Appendix A shall be restored as nearly as practical to its original condition. Bare areas created by construction activities will be reseeded in compliance with Appendices K and L to prevent soil erosion.

3.2.3. After construction is complete, and in cooperation with the LANDOWNER, temporary roads shall be closed.

3.2.4. In agricultural areas where soil has been compacted by movement of construction equipment and unless otherwise specified by the LANDOWNER, the OWNER shall direct the CONTRACTOR to rip the soil deep enough to restore productivity, or if complete restoration is not possible, the OWNER shall compensate the LANDOWNER for lost productivity.

3.2.5. Earth next to access roads that cross streams shall be replaced at slopes less than the normal angle of repose for the soil type involved.

3.2.6. All drainage channels shall be restored to a gradient and width that will prevent accelerated gully erosion.

3.2.6. Drive-through dips, open-top box culverts, waterbars, or cross drains shall be added to roads at the proper spacing and angle as necessary to prevent erosion.

3.2.7. Interrupted drainage systems shall be restored.

3.2.8. Sidecasting of waste materials may be allowed on slopes over 40 percent after approval by the LANDOWNER, however, this will not be allowed within the buffer strip established for stream courses, in areas of high or extreme soil instability, or in other SENSITIVE AREAS identified in Appendix A. Surplus materials shall be hauled to LANDOWNER-approved sites in such areas.

3.2.9. Seeding prescriptions to be used in revegetation, requirements for hydroseeding, fertilizing, and mulching, as jointly determined by representatives of the OWNER, DEQ, and other involved state and federal agencies, are specified in Appendix L.

3.2.10. Piling and windrowing of material for burning shall use methods that will prevent significant amounts of soil from being included in the material to be burned and minimize destruction of ground cover. Non-mechanized methods are recommended if necessary to minimize soil erosion and vegetation disturbance. Piles shall be located so as to minimize danger to timber and damage to ground cover when burned.

3.2.11. During restoration in areas where topsoil has been stockpiled, the site will be graded to near natural contours and the topsoil will be replaced on the surface.

3.2.12. Excavated material not suitable or required for backfill shall be evenly filled back onto the cleared area prior to spreading any stockpiled soil. Large rocks and boulders uncovered during excavation and not buried in the backfill will be disposed of as approved by the STATE INSPECTOR and/or LANDOWNER.

3.2.13. Application rates and timing of seeds and fertilizer, and purity and germination rates of seed mixtures, shall be as determined in consultation with DEQ. Reseeding shall be done at the first appropriate opportunity after construction ends.

3.2.14. Where appropriate, hydro seeding, drilling, or other appropriate methods shall be used to aid revegetation. Mulching with straw, wood chips, or other means shall be used where necessary. Areas requiring such treatment are listed in Appendix L.

3.2.15. All temporary roads shall be obliterated and reclaimed (with the concurrence of the LANDOWNER), as specified in Appendix M. All temporary roadways shall be graded and scarified as specified to permit the growth of vegetation and to discourage traffic. Permanent unsurfaced roadbeds not open to public use will be revegetated as soon after use as possible unless specified otherwise by the LANDOWNER.

3.3. MONITORING

3.3.1. Upon notice by the OWNER, the STATE INSPECTOR will schedule initial post-construction field inspections following cleanup and road closure. Follow-up visits will be scheduled as required to monitor the effectiveness of erosion controls, reseeding measures, and the right-of-way management plan (Appendix N). The STATE INSPECTOR will contact the LANDOWNER for post-construction access and to determine LANDOWNER satisfaction with the OWNER's restoration measures.

3.3.2. The STATE INSPECTOR shall document observations for inclusion in monitoring reports regarding bond release or the success of mitigating measures required by DEQ.

3.3.2. Failure of the OWNER to adequately reclaim all disturbed areas in accordance with section 3.2 and Appendix K of these specifications shall be cause for forfeiture of the reclamation BOND(s) or penalties described in Section 0.3. Success of revegetation shall be based on criteria specified in the reclamation and revegetation plan (Appendix K). Failure of the OWNER to achieve adequate revegetation of disturbed areas in accordance with Appendix K shall be cause for forfeiture of the revegetation BOND(s) or penalties described in Section 0.3.

4.0. OPERATION AND MAINTENANCE

4.1. RIGHT-OF-WAY MANAGEMENT AND ROAD MAINTENANCE

4.1.1. Maintenance of the right-of-way and permanent access roads shall be as specified in the right-of-way management plan (Appendix N). This plan shall provide for the protection of SENSITIVE AREAS identified prior to and during construction as well as control of erosion on permanent access roads.

4.1.2. Vegetation that has been saved through the construction process and which does not pose a hazard or potential hazard to the transmission line, particularly that of value to fish and wildlife as specified in Appendix A, shall be allowed to grow on the right-of-way.

4.1.3. Vegetative cover adjacent to the transmission line in areas other than cropland shall be maintained in cooperation with the LANDOWNER.

4.1.4. Grass cover, water bars, cross drains, the proper slope, and other agreed to measures shall be maintained on permanent access roads and service roads in order to prevent soil erosion.

4.2. MAINTENANCE INSPECTIONS

4.2.1. The OWNER shall have responsibility to correct soil erosion, noxious weed, or revegetation problems on the right-of-way or access roads as they become known. Appropriate corrective action will be taken where necessary. The OWNER, through agreement with the LANDOWNER or managing agency, may provide a mechanism to identify and correct such problems but the OWNER is responsible for correcting these problems.

4.2.2. Operation and maintenance inspections using ground vehicles shall be timed so that routine maintenance will be done when access roads are firm, dry, or frozen, wherever possible. Maintenance vegetative clearing shall be done according to criteria spelled out in Appendix N.

4.3. CORRECTION OF LANDOWNER PROBLEMS

4.3.1. When the facility causes interference with radio, TV, or other stationary communication systems after the facility is operating, the OWNER will correct the interference with mechanical corrections to facility hardware, or antennas, or will install remote antennas or repeater stations, or will use other reasonable means to correct the problem.

4.3.2. The OWNER will respond to complaints of interference by investigating complaints to determine the origin of the interference. If the interference is not caused by the facility, the OWNER shall so inform the person bringing the complaint. The OWNER shall provide the STATE INSPECTOR with documentation of the evidence regarding the source of the interference if the person brings the complaint to the STATE INSPECTOR or DEQ.

4.4. HERBICIDES AND WEED CONTROL

4.4.1. Weed control, including any application of herbicides in the right-of-way, will be done by applicators currently licensed in Montana and in accordance with recommendations of the Montana Department of Agriculture, and in accordance with the right-of-way maintenance plan in Appendix N.

4.4.2. Herbicides will not be used in certain areas identified by DEQ and DFWP, as listed in Appendix O or as requested by the LANDOWNER.

4.4.3. Proper herbicide application methods will be used to keep drift and nontarget damage to a minimum.

4.4.4. Herbicides must be applied according to label specifications and in accordance with 4.4.1 above. Only herbicides registered in compliance with applicable federal and state laws may be applied.

4.4.5. Herbicides shall not be sprayed during heavy rains or threat of heavy rains. Vegetation buffer zones shall be left along all identifiable stream channels. Herbicides shall not be used in any public water supply watershed identified by DEQ.

4.4.6. In areas disturbed by the transmission line, the OWNER will cooperate with LANDOWNERs in control of noxious weeds as designated by the weed control board having jurisdiction in the county crossed by the line.

4.4.6. The OWNER shall notify the STATE INSPECTOR in writing 30 days prior to any broadcast or aerial spraying of herbicides. The notice shall provide details as to the time, place, and justification for such spraying. DEQ, DFWP, and the Montana Department of Agriculture shall have the opportunity to inspect the portion of the right-of-way or access roads, schedule for such treatment before, during, and after spraying.

4.4.7. During the second and third growing seasons following the completion of restoration and reseeding, the OWNER and STATE INSPECTOR shall inspect the right-of-way and access roads for newly established stands of noxious weeds. The county weed control supervisor shall be invited to attend this inspection. In the event that stands of weeds are encountered, the OWNER shall take appropriate control measures.

4.5. MONITORING

4.5.1. DEQ may continue to monitor operation and maintenance activities for the life of the project in order to ensure compliance with the specifications in this section (see Appendix Q).

4.5.2. The OWNER will be responsible to DEQ for the term of the reclamation BOND (Section 0.8). After this time, the OWNER will report to individual LANDOWNERs and managing agencies except as specified in conditions to the certificate.

4.5.3. Upon reasonable complaint from an affected LANDOWNER or managing agency, DEQ may require the OWNER to fund additional monitoring efforts to resolve problems that develop after release of the BONDs. Such efforts would be limited to determining compliance with these specifications and other conditions of the Certificate.

5.0 ABANDONMENT

When the transmission line is no longer used or useful, structures, conductors, and ground wires shall be removed and disturbed areas reclaimed using methods outlined in Appendix K.

APPENDICES

Appendix A: Sensitive Areas for the Valley County Wind Energy Project 230kV Transmission Line.

The following sensitive areas have been identified for monitoring during construction and reclamation activities:

1. Sensitive areas are: Overhead ground wires shall be marked in the following areas to reduce the potential for avian collisions with the transmission line. As shown on Figure 2.3-4 of the Valley County Wind Energy Project Environmental Assessment:

- Between mileposts 1.7 and 2.0 on Link 3
- Between mileposts 9.6 and 9.8 on Link 3
- Between mileposts 4.7 and 5.2 on Link 4
- Between mileposts 5.7 and 6.0 on Link 4

2. Additional areas for monitoring may be identified following the pre-construction monitoring trip by the State Inspector or the Inspector's designee.

Appendix B: Performance Bond Specifications

_____ construction and reclamation bonds shall be used to ensure performance with these specifications.

Appendix C: Variations In Right-of-Way Width

DEQ does not recommend specific widths for construction easements. In accordance with the specifications, construction activities shall be contained in the minimum area necessary for safe and prudent construction.

DEQ does not recommend specific variations in right-of-way widths beyond those required to meet the National Electric Safety Code for electric transmission line operations and those necessary to meet standards established in ARM 17.20.1607(2).

Appendix D: Areas Where Construction Timing Restrictions Apply

No restrictions in the timing of construction are recommended, beyond those considered necessary on the basis of onsite inspections of stream crossings required in Section 2.11.6 of these specifications and in other sections of these specifications, or as negotiated by LANDOWNERs in individual easement agreements.

Appendix E: Aeronautical Hazard Markings

DEQ does not recommend aeronautical hazard markings at this time. Once the nature of any potential hazard is known, DEQ will consult with the Federal Aviation Administration and Montana Aeronautics Division of DOT to determine appropriate action or aeronautical safety marking.

Appendix F: Noxious Weed Areas

Noxious weed areas will be determined during a joint inspection by the OWNER, affected weed control boards, and LANDOWNERs. Weeds will be controlled as directed by county Noxious Weed Control programs and state law.

Appendix G: Grounding Specifications

Powerlines shall be grounded in accordance with the National Electrical Safety Code.

Appendix H: Culvert and Bridge Requirements

It does not appear that new culverts or bridges will be needed during construction. In the event a culvert or bridge is needed, it shall be installed to the standards set forth in Section 2.11.11 of the specifications.

Appendix I: Historic Preservation Plan

The OWNER, in consultation with SHPO and the National Advisory Council on Historic Preservation, shall develop a plan for identification and treatment of historical or archaeological sites affected by construction. Copies of these plans shall be part of this Appendix. The plan shall identify proposed treatments to be employed to avoid, mitigate or offset project effects on cultural resource sites or culturally significant tribal resources as agreed to by SHPO.

Appendix J: Burning Plan and Fire Plan

The need for a detailed burning or fire plan is not anticipated for this project. In the event that burning is required prior to or during construction, such burning shall occur in accordance with sections 0.5, 2.13, and 2.14 of the specifications.

Appendix K: Reclamation and Revegetation Plan

A reclamation and revegetation plan must be developed and submitted to DEQ for approval. This plan must, at a minimum, specify seeding mixtures, rates, seeding methods and timing of seeding. It must satisfy LANDOWNER wishes, requirements of the MPDES General Permit for Storm Water Discharges Associated with Construction Activity, and ARM 17.20.1902(10).

If a LANDOWNER's management practices prevent the attainment of 90 percent ground cover after five (5) years, revegetation on that land will be deemed adequate when portions of the right-of-way disturbed by construction and temporary roads are reclaimed to a state of usefulness similar to that existing prior to construction.

Appendix L: Areas Where Stockpiling of Topsoil, Hydro Seeding, Fertilizing, or Mulching is Required

Appendix M: Roads to be Closed and/or Obliterated

It does not appear that it will be necessary to build permanent roads for access or maintenance for this project. If such roads are necessary, the OWNER shall close or obliterate the roads as requested by the LANDOWNER.

Appendix N: Right-of-Way Management Plan

DEQ does not recommend a specific right-of-way management plan. To the extent possible, all maintenance and operation activities shall be performed to comply with the requirements of the environmental specifications.

Appendix O: Watersheds and Other Areas Where Herbicides are Prohibited

DEQ does not recommend any areas or watersheds where herbicide use is prohibited. Herbicide use shall conform to all applicable local, state, and federal restrictions.

Appendix P: Name and Address of State Inspector

STATE INSPECTOR	OWNER'S LIAISON
Environmental Science Specialist	
Montana Dept of Environmental Quality	
P.O. Box 200901	
1520 East Sixth Avenue	
Helena, Montana 59620-0901	
(406) 444-_____	

Appendix Q: Monitoring Plan

The STATE INSPECTOR is responsible for implementing this monitoring plan required by 75-20-303(b) and (c), MCA, and for reporting whether terms of the Certificate and Environmental Specifications are being met, along with any conditions in the Stormwater Discharge permit and state land easements. The STATE INSPECTOR may identify additional mitigating measures in order to minimize environmental damage due to unique circumstances that arise during construction. These measures will be presented in writing to the Owner's Liaison who will see that such measures are implemented in a timely manner.

In the growing season following construction the STATE INSPECTOR will determine the adequacy of erosion controls, check for successful seed germination, and determine in conjunction with county weed supervisors areas where weed control would be necessary.

After one and five complete growing seasons following construction, the STATE INSPECTOR will determine whether revegetation efforts have been sufficient to meet the requirements of Appendix K of these Environmental Specifications. If revegetation is not adequate to meet the requirements of Appendix K, the STATE INSPECTOR shall determine whether it is in the best interest of the State to seize the BOND or BONDs and reclaim and revegetate remaining disturbed areas or to continue to monitor these areas. The STATE INSPECTOR shall respond to complaints from citizens for the life of the project.

When violations of the Certificate are identified, the STATE INSPECTOR shall report the violation in writing to the OWNER, who shall immediately take corrective action. If violations continue, civil penalties described in 75-20-408, MCA may be imposed.

APPENDIX F
Overview of Land Jurisdiction, Ownership and Land Use in the VCWEP Area

Overview of Land Jurisdiction, Ownership and Land Use in the VCWEP Area

This appendix provides an overview of current land jurisdiction and ownership as well as land uses within the Valley County Wind Energy Project (VCWEP) area. Emphasis is placed on areas where facilities associated with the VCWEP would be located. In addition, the information presented in this appendix identifies specific federal, state, and local agency jurisdictions within the VCWEP area and identifies relevant planning documents and associated land use designations as well as other regulatory considerations that may be applicable to the VCWEP.

Land Jurisdiction and Ownership

Land jurisdiction and ownership was identified and delineated using data obtained from the Montana Natural Resources Information System (NRIS) Geographic Information System (GIS). The NRIS GIS acts as a clearinghouse for GIS databases.

Public land (including Bankhead-Jones L.U. land), administered by the United States Department of the Interior (USDI), Bureau of Land Management (BLM), state trust land administered by the Montana Department of Natural Resources and Conservation (DNRC), Valley County owned land, and private land under county jurisdiction are all present in the VCWEP area. No incorporated areas were located in the VCWEP area.

Existing Land Use

The VCWEP is located in northeastern Montana's Hi-Line region in Valley County. Existing land use identifies various surface structures, improvements and land use designations occurring within the study area as of September 2004. The following categories, listed below, were developed to differentiate between types of existing land use.

Residential

The unincorporated community of St. Marie (2000 population of 183) is located in the VCWEP area, east of Montana Highway 24, approximately 14 miles northeast of the City of Glasgow. Other population centers include large-lot rural residential development, and farmsteads. Farmsteads represent isolated residential structures with structures associated with farming or ranching operations. Most residences are located south of U.S. Highway 2. The incorporated City of Glasgow (2000 population of 3,253), is situated approximately 2 miles south/southeast of the VCWEP area along U.S. Highway 2. The City of Glasgow is the county seat of Valley County.

Commercial, Industrial, and Public and Institutional

Commercial, industrial, and public and institutional uses are primarily found outside of the VCWEP area, in and around Glasgow. Currently, there are no plans for future schools in the VCWEP area (Nyquist 2004 and Hageman 2004).

Communication Site

Commercial microwave, cellular and radio towers are generally located outside of the VCWEP area, in and around Glasgow. One microwave facility was identified at a Northern Border Pipeline compressor station, located approximately 29 miles north of the City of Glasgow. A second microwave facility was identified adjacent to Northwestern Energy's Richardson Coulee Substation. A communication site associated with a Nemont Telephone Cooperative building was also identified west of Montana Highway 24, approximately 3 miles southwest of St. Marie.

Agriculture

Ranching and farming are an important part of the economy in Valley County. The number of farms increased slightly between 2002 and 1997, while the acreage in farms increased 15%.

Agriculture (crops and livestock) is a predominate land use within the VCWEP area. Other forms of agriculture in the VCWEP area include Montana Department of Agriculture registered general (commercial) apiaries which are used for honey production and/or pollination. General (commercial) apiary registrations are apiaries placed by permission on someone's property and contains more than 5 hives.

The crops category includes irrigated and non-irrigated field crops. Irrigated cropland is primarily found in the Milk River valley within the VCWEP area. The land is irrigated primarily by surface flooding. Among the crops grown on irrigated land, the most common are alfalfa and small grains such as wheat and barley. Other crops grown include grass and grain hays, silage, safflower, corn, and livestock pasture. Non-irrigated cropland (dryland agriculture) comprises the bulk of cultivated land in the VCWEP area and is generally found on the adjacent uplands. Principal crops include wheat, barley, oats and grain hay. Not all the acres devoted to dryland agriculture are planted each year. Much of the land is cultivated under an alternate crop-fallow system. Crop type at any one location is variable and occasionally in fallow. Aerial spraying (crop dusting) is used to control insects weeds, and diseases in some agricultural areas.

A portion of the Bureau of Reclamation's (BOR) Milk River Project is located within the VCWEP area. The entire project furnishes water for the irrigation of about 121,000 acres of land. A water supply is furnished to project lands which are divided into the Chinook, Malta, and Glasgow Divisions and the Dodson Pumping Unit. The lands extend about 165 miles along the river from near the City of Havre to a point 6 miles below the Town of Nashua. At the Vandalia Diversion Dam, 3 miles west of Vandalia, the Vandalia South Canal diverts water on the south side of the river for the irrigation of land near Tampico, City of Glasgow, and Town of Nashua, comprising the Glasgow Irrigation District. The Vandalia South Canal from the diversion dam has its point of diversion in the SW¼NW¼ of Sec 7, T30N, R37E. The Vandalia South Canal has a length of 42.75 miles and a design capacity of 300 cubic feet per second. The storage works are operated by the Bureau of Reclamation. The distribution systems are operated and maintained by the Glasgow Irrigation District. The Glasgow Irrigation District (GID) supplies water to 100 members irrigating 18,011 acres, in the Milk River Valley. A Special Use Permit would need to be obtained from the BOR if the final transmission line route would cross BOR owned lands or would modify BOR ditches and canals. If the final transmission line route crossed BOR ditches and canals for which BOR only has an easement and no modifications to the ditches or canals occur, an Acknowledgement of Easement Crossing would need to be obtained from BOR, (Stiles 2004)

Some land within the study area also has also been classified as Important Farmland and Conservation Reserve Program (CRP) land. Land identified as being Important Farmland is based on soil types. In accordance with the Farmland Protection Act of 1981, important farmland includes all land that is defined as prime, unique, or farmlands of statewide or local importance. Natural Resources and Conservation Service defines these as follows:

Prime Farmland Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and within allowable soil erosion tolerance, as determined by NRCS.

Unique Farmland Land other than prime farmland that is used for the production of specific high-value food and fiber crops, as determined by NRCS. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods.

Local or Statewide Importance Land other than prime or unique farmland that is determined to be important by the appropriate State, tribal, or unit of local government agency or agencies, with concurrence by the State Conservationist.

U.S. Congressional Public Law 95-87 (*Federal Register* January 31, 1978: Part 657) requires the NRCS to identify and map prime and unique farmland. These farmlands are protected under the Farmland Protection Act of 1981. According to a review of the important farmland mapping obtained from the NRCS, the following two types of important farmland were identified in the VCWEP area:

"prime farmland if irrigated"

"farmland of statewide importance"

Valley County land enrolled in the CRP totaled 211,309.3 acres as of November 16, 2005 (NRCS 2006).

Grazing land includes non-cropland and non-CRP land made up of several different vegetation cover types, which are grazed by livestock (see vegetation cover types in Section 3.7 Biological Resources). Livestock includes cattle, sheep, and horses.

Land within the VCWEP area is allocated for livestock grazing. BLM land complements state and private grazing land. Cow/calf and yearling cattle are the most significant classes of livestock authorized. A few horses are authorized in conjunction with cattle permits. The Montana DNRC Agriculture and Grazing Management Bureau is responsible for leasing and managing agreements for crop (agricultural) and rangeland (grazing) uses on school trust lands. Crops raised on state trust lands are primarily dryland hay and small grains. Valley County owned land is also leased for grazing.

Types of existing structural rangeland improvements within the VCWEP area include wells, pipelines, troughs, fences, guzzlers, reservoirs and cattle guards.

Air Facility

Refer to Section 3.3 Transportation.

Oil and Gas

A large portion of the federal mineral estate, subsurface state trust land, and subsurface Valley County owned land have been leased or are available for leasing for oil and gas. Currently there are no producing oil and gas wells in the VCWEP area. There is, however, the likelihood of additional gas exploration in or around the VCWEP area in the future. According to BLM's Final Judith-Valley-Phillips Resource Management Plan (RMP) and Environmental Impact Statement (EIS), the VCWEP area has a moderate potential for oil and gas development. Historically, most oil and gas exploration in and around the VCWEP area has been geared toward natural gas. The Bowdoin Dome gas field is located west and northwest of the VCWEP area (mostly in Phillips

County). Gas produced in this area is collected into sales lines operated by the Williston Basin Interstate Pipeline Company. The Vandalia gas field extends into areas of T30N, R36E-37E.

Surface Mines

Sand and gravel deposits are present in the VCWEP area with extractive operations found along the Milk River and its tributaries as well as along upland terraces formed by previous fluvial deposition.

A MDEQ permitted opencut sand and gravel operation was identified within the VCWEP area. The Opencut Mining Act (82-4-4-1 et. Seq., MCA) and regulations apply to the mining of bentonite, clay, scoria, soil materials, peat, sand or gravel. An operator may not conduct Opencut mining operations that result in the removal of a total of 10,000 cubic yards or more of materials and overburden until the department has issued a permit to the operator for the reclamation of the land affected.

No MDEQ permitted hard rock mines or coal mines (strip or underground mining operations) were identified in the VCWEP area.

In addition, BLM's policy on public lands is to make mineral material (i.e., sand, building stone, gravel, pumice, cinders, and clay) available to the public and local governmental agencies whenever possible and whenever it is environmentally acceptable. Mineral material is sold to the public at fair market value, but is given free to states, counties, or other government entities for public projects. A limited amount may also be provided free to non-profit groups. No BLM mineral material sites were identified within the VCWEP area.

Mining Claims

No active BLM mining claims were identified in the VCWEP area.

Linear Features

The subcategories of linear features are:

- Electrical Transmission Lines
- Major Pipelines
- Major Irrigation Canals
- Railroads (Refer to Section 3.3 Transportation)
- Federal, State, and County Roadways (Refer to Section 3.3 Transportation)

Electrical transmission lines in the VCWEP area with a voltage of 50kV or greater were located and mapped. Northwestern Energy (NWE) and Northern Electric Cooperative currently operate 69kV transmission lines within the VCWEP area.

Two major pipelines run through the VCWEP area. Northern Border Pipeline Company owns and operates a 42-inch pipeline which transports natural gas from the Montana-Saskatchewan border to interconnecting pipelines in the upper Midwestern United States. Williston Basin Interstate Pipeline Company operates a 10-inch pipeline (Saco – Morgan Creek Line) that transmits natural gas from the Bowdoin gas field east for local distribution via smaller diameter pipelines.

Proposed Dry Prairie Rural Water Supply core water transmission lines as well as distribution lines were also identified in the VCWEP area. These lines are part of the Fort Peck Reservation Rural Water System Project.

One major irrigation canal crosses the VCWEP area. The Vandalia South Canal and associated laterals are operated by the Glasgow Irrigation District. Irrigation ditches within the VCWEP area are designed to flow toward the Milk River.

Other utilities located in the study area include fiber optic transmission lines and telephone lines.

Planned Land Use

The following planned land uses were assessed for this study component: (1) comprehensive plans and zoning ordinances for the VCWEP area (2) land or resource management plans and (3) proposed land uses identified through agency contacts.

Public lands administered by the BLM in the VCWEP area are guided by the Approved Valley Resource Area RMP. The approved RMP (September 1994) includes those decisions from the proposed Judith-Valley-Phillips RMP and final environmental impact statement (1992) that pertain to the Valley Resource Area (RA) with the exception of those decisions for oil and gas leasing. The approved RMP sets forth the land use decisions, terms and conditions for guiding future management of lands and minerals administered by the BLM within the Valley RA. The Valley Resource Area name has been changed to the Valley County Planning Area (PA) and those BLM lands are administered out of the Glasgow Field Station of the Malta Field Office. The Valley County planning area encompasses 2,698,017 acres, of which 1,019,886 surface acres (38%) and 1,134,644 acres of mineral estate (42%) are administered by the BLM.

There is one designated right-of-way corridor through the Valley PA. This designation was established for the Northern Border Pipeline by the Federal Register Publication dated August 28, 1979. The RMP does not identify corridors because of the small amounts of BLM land along occupied corridors. Avoidance areas and windows were not identified in the PA. The Bitter Creek Wilderness Study Area (WSA) is a temporary exclusion area, pending wilderness area determinations. Wilderness Study Areas are not subject to right-of-way application. Right-of-ways outside of WSAs will be considered on a case-by-case basis with appropriate stipulations from the BLM Manual Handbook H-2801-1 incorporated into the right-of-way grant. The primary authorities for issuing of right-of-ways are the Federal Land Policy and Management Act (FLPMA) of 1976 and the Mineral Leasing Act of 1920 (MLA).

The United States Department of the Interior, Bureau of Land Management (BLM), has prepared a Final Programmatic EIS to evaluate issues associated with wind energy development on Western public lands (excluding Alaska) administered by the BLM. The release of the Final PEIS was published in the Federal Register on June 24, 2005. The proposed action analyzed in the Final PEIS would implement a Wind Energy Development Program, establish policies and best management practices for wind energy right-of-way authorizations, and amend 52 BLM land use plans. A Record of Decision to implement the Wind Energy Development Program and amend the land use plans was issued on December 15, 2005.

Farm Service Agency's (FSA) final PEIS for the CRP was published in the Federal Register on February 17, 2003. A Record of Decision for the PEIS was published in the Federal Register on May 8, 2003. Withdrawal of a portion of land from a CRP contract for the production of wind energy is consistent with decision reached in the PEIS. Individual projects require the appropriate level of analysis under the NEPA.

Pursuant to 77-1-301, MCA, the DNRC manages the surface and mineral resources for the benefit of the common schools and other endowed institutions in the State of Montana, within six administrative land offices, under the direction of the State Board of Land Commissioners. The Department's obligation for management and administration of Trust Land is to obtain the greatest benefit for the beneficiaries. The greatest monetary return must be weighed against the long-term productivity of the land to ensure continued future returns to the trusts. The division is divided into four bureaus: Forest Management, Mineral Management, Agriculture and Grazing Management, and Real Estate Management. The Northeastern Land Office facilitates local management of the Trust Lands within the VCWEP area. The Trust Land Management Division (TLMD) of the Montana DNRC has engaged in an environmental impact statement process to compare and disclose impacts of alternative management guidelines for real estate activities on state Trust Lands. The Draft Environmental Impact Statement (DEIS) was released on June 21, 2004, and the Final Environmental Impact Statement (FEIS) was released on November 19, 2004. The selected alternative was the Real Estate Management Plan for the TLMD. The Plan provides the TLMD with consistent policy, direction, and guidance in the selection and management of real estate activities (residential, commercial, industrial and conservation on state Trust Lands.

The Valley County Board of County Commissioners (Board) has established a Planning Board and community-based subcommittee to advise and assist the Board in formulating county policy with respect to land and resource use issues. The subcommittee is known as the *Resource Use Committee* and the plan they are working on is known as the *Resource Use Plan*, which is one component of the County Comprehensive Plan. The manual is in the interim stage of composition. It is the intention of the "Valley County Resource Use Plan" to be the forerunner of the completed manual, "Valley County Land and Resource Use Plan". The adoption of the final plan is projected for July 1, 2006.

The interim *Valley County Resource Use Plan* states as a policy:

"1. GOAL: Encourage appropriate mineral and energy resource exploration and development in Valley County.

Objective 1A: Encourage elimination of unreasonable or unfounded barriers, prohibitions, and impediments to mineral and energy resource exploration and development.

Objective 1B: Support the retention of existing mineral and energy operations, consistent with sound economic and environmental practices.

Objective 1C: Support large and small-scale mineral and energy resource exploration consistent with sound economic and environmental practices.

Valley County does not have any zoning regulations or special/conditional use permit requirements for wind farms, transmission lines, or substations."

Parks, Recreation, and Preservation Areas

Dispersed outdoor recreation is the predominant type of recreation within the VCWEP area and surrounding region. Dispersed recreational use in the VCWEP area and vicinity includes: hunting (big game and upland game birds), fishing, hiking, wildlife observation, photography, backpacking, horseback riding, skiing, snowmobiling, mountain biking, picnicking, sightseeing, off highway vehicle, (OHV) use, rock hounding, and camping in the Bitter Creek WSA. Recreational activities within the VCWEP area occur on BLM land, Montana state school trust land, and private land.

Hunting

Common species hunted include sage grouse, sharp-tailed grouse, hungarian partridge, pheasant, mule deer, white-tailed deer, and antelope. Most opportunities occur in the riparian areas along major drainages and along the Milk River. Sage grouse, sharp-tailed grouse, and hungarian partridge are located in most parts of the county. Pheasants are less numerous and confined mostly to the farming areas along the Milk River. Mule deer are the most numerous of the big game animals, occupying coulees bordering major streams. White-tailed deer are mostly confined to the Milk River, Frenchman Creek, Rock Creek, and a few other smaller stream bottoms. Antelope are found throughout the county.

Most BLM lands are legally accessible via a public road, navigable waterway, or adjacent state or federal land that are open to hunting. Permission must be obtained from the landowner to cross adjacent private land to hunt on BLM land.

Hunting also occurs on state school trust land and private land. Hunting on private land is subject to landowner discretion. Hunting opportunities also arise on private lands as a result of MFWP actions, through the block management program and conservation easements. The block management program is a cooperative effort between MWFP, landowners, and land management agencies to provide free public hunting access to private and isolated public land. Conservation easements negotiated by MWFP preserve wildlife habitat. These areas generally offer some level of public hunting access. Lands enrolled in the Upland Game Bird Habitat Enhancement Program and Migratory Bird Stamp Program also offer hunting opportunities.

Fishing

Fishing opportunities within the VCWEP area primarily occur along the Milk River. Fair to good fishing is present in the Milk River for sauger, walleye, and catfish on a seasonal basis. MFWP has assigned the Milk River, from river mile 0.0 to river mile 120.7, a Habitat Class of 1 and a Sport Class of 3. As such, MFWP has determined that this segment of the Milk River has a final Fisheries Resource Value of *Outstanding*. The final Fisheries Resource Value was determined as the higher of the two values (Habitat and Species Value and Sport Fishery Value).

BLM Recreation Management

The BLMs Valley County Planning Area contains two recreation management areas, Valley with 366,486 acres and South Valley with 643,400 acres. Portions of both of these areas are within the VCWEP area. The Valley Recreation Management Area (RMA) is an extensive recreation management area where a limited commitment of resources provide dispersed and unstructured recreational activities. The Valley RMA primarily comprises the VCWEP area. Four undeveloped recreation sites within this RMA were identified in the study area. These sites include three fishing reservoirs (Atlas, Gay and Langen) and a day use area along the Milk River (Faraasen Park). Atlas Reservoir is located in T32N, R38E, Section 24, Gay Reservoir in T33N, R37E, Section 2, and Langen Reservoir in T33N, R38E, Section 26. Faraasen Park is situated approximately 6 miles northwest of Glasgow. Faraasen Park development plans include a parking lot, an interpretive nature trail and improved wildlife habitat and riparian areas.

The South Valley RMA is a special recreation management area which provides opportunities for hunting, scenic and wildlife viewing and driving for pleasure. One undeveloped recreation site within this RMA (Shoot Reservoir) was identified in the VCWEP area. This fishing reservoir is located in T28N, R38E, Section 10.

Generally, BLM land provides a wide range of recreational opportunities from picnicking, sightseeing and watching wildlife to hunting and fishing. These opportunities meet a diversity of visitor preferences. Participation in specific recreational activities varies with the season of the year. Hunting dominates the scene in the fall with limited snowmobiling and cross-country skiing during the winter. Springtime activities include fishing, sightseeing and photography. Camping, picnicking, pleasure driving, sightseeing, and hiking dominate recreation during the summer months along with dispersed Off-Highway Vehicle (OHV) use. Overall, BLM land supports the heaviest use occurring during the fall hunting seasons. BLM land received about 9000 recreation visits in 2004. OHV use is primarily associated with other activities such as hunting, fishing and driving for pleasure. These activities account for approximately 75% of the total visitor use in the VCWEP area. The major types of off highway vehicles used are the two-wheel or four-wheel drive pickup and the all terrain vehicle (ATV). The numerous unimproved roads and trails scattered throughout the VCWEP area provide access for off highway travel.

Motorized vehicle use on BLM public lands is managed according to the June 2003 Off Highway Vehicle Record of Decision (ROD) EIS and Plan Amendment for the Judith-Valley-Phillips RMP. With this decision, these lands are designated limited yearlong for motorized wheeled cross-country travel. Limited area means an area restricted at certain times, in certain areas, and/or to certain vehicular use. It restricts motorized wheeled cross-country travel, with some exceptions, throughout the study area to protect riparian areas, wetlands, crucial wildlife habitat, threatened or endangered species, soils and vegetation, aquatic resources, and to reduce user conflicts.

Through subsequent site-specific planning, the BLM will designate roads and trails for motorized use. BLM is currently inventorying, mapping, and analyzing existing roads and trails for evaluation and designation as open, seasonally open, or closed.

Most snowmobiling is done for the enjoyment derived from operating the machine and is considered dispersed recreation use.

Six outfitters currently hold special recreation permits from the Glasgow Field Station for big game hunting.

BLM Wilderness Study Area

There are currently no designated BLM wilderness areas within the VCWEP area. One wilderness study area (WSA), Bitter Creek, is located in the VCWEP area. WSAs are remote and undeveloped lands with at least 5,000 acres. They offer primitive and unconfined recreation opportunities and/or some special resource values. The Bitter Creek WSA was determined by BLM to be not suitable for wilderness designation. Since this area is a WSA, management is guided by the Interim Management Policy for Lands Under Wilderness Review until they are acted upon by Congress. Congress can designate the WSA or portions thereof as wilderness, deny designation or continue study of the area. There is no timetable set for when Congress must act on this designation. The Bitter Creek WSA is located approximately 25 miles northwest of the City of Glasgow, and 18 miles south of the Canadian border. The WSA contains 59,600 acres of BLM land located in three roadless segments identified as Bitter Creek South, Bitter Creek West and Bitter Creek East. Major recreation interests include hunting, wildlife viewing, hiking, sightseeing, nature study, and photography. Other recreational uses include camping, backpacking, and horsebacking. The Bitter Creek WSA has been selected for a wildlife viewing zone under the Watchable Wildlife program. This watchable wildlife area (Bitter Creek Wildlife Viewing Area) is situated on the eastern rim of the Bitter Creek WSA where hawks and eagles

can be seen soaring over the WSA. This rim differs in elevation by as much as 600 feet from the floor of the WSA.

The area is managed for sparse use which is appealing to individuals who value for example; challenge, remoteness, harsh conditions, risk taking, pioneering, self-reliance, and minimal social encounters. OHV use is restricted yearlong to the numbered roads only, while foot and horse travel carry no restrictions.

If Congress adopts BLM's recommendation and releases Bitter Creek from WSA status, a plan for management of the WSA as an ACEC would be initiated. The Bitter Creek WSA was found to meet the criteria as a potential ACEC due to the scenic diversity and variety of vegetation types and wildlife habitats. An ACEC is an area where special management attention is required to protect important historic, cultural or scenic values, fish and wildlife resources or other natural systems, or to protect life and safety from natural hazards.

Montana Fish, Wildlife & Parks

Park and Recreation Facilities

As of October 28, 2004, no state parks or recreation facilities are proposed in the VCWEP area (Baxter 2004).

Recreational Trails

The *Montana State Trails Plan* Inventory of Montana's Trail System did not identify any recreational trails within the VCWEP area.

Land and Water Conservation Site

Section 6(f) resources are those acquired through the use of Land and Water Conservation Funds (LWCF). The LWCF (Public Law 88-578) was enacted by Congress to provide money to federal, state, and local governments to purchase lands for maintaining or enhancing recreational opportunities, clean water, wildlife habitat, scenic resources, historic sites, and wilderness areas (Land and Water Conservation Fund, 2003; U.S. Forest Service, 2003). Resources that have been purchased using LWCF cannot be converted to other than public outdoor recreation uses without the approval of the Department of Interior's National Park Service (NPS). Section 6(f) directs the NPS to assure that replacement lands of equal value, location, and usefulness are provided to mitigate conversions of these lands for other than public outdoor recreation uses.

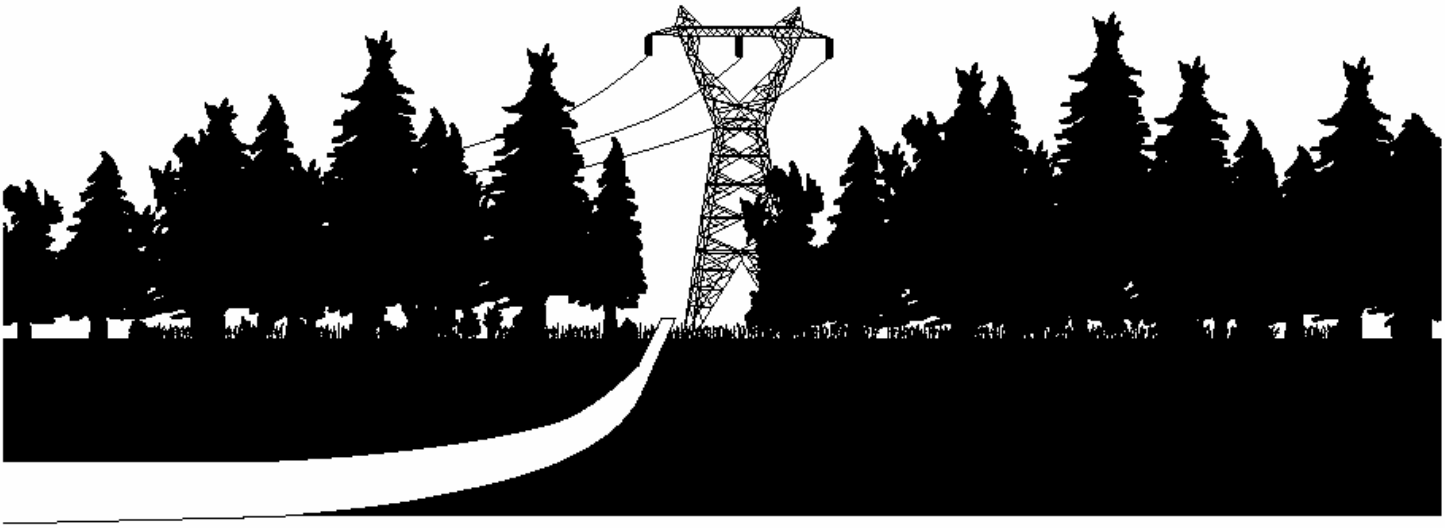
One Section 6(f) Site (Glasgow Base Pond Fishing Access Site) was identified in the VCWEP area and is administered by the MFWP.

APPENDIX G
WAPA Construction Standards
Environmental Quality Protection

CONSTRUCTION STANDARDS

STANDARD 13

ENVIRONMENTAL QUALITY PROTECTION



June 2003

STANDARD 13 - ENVIRONMENTAL QUALITY PROTECTION

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SECTION 13.1--CONTRACTOR FURNISHED DATA

1. RECYCLED MATERIAL QUANTITY REPORT: Submit quantities for recycled material listed in Section 13.6, "Recycled Material Quantities", to the COR after completion and prior to submittal of final invoice.

2. PRODUCTS CONTAINING RECOVERED MATERIAL REPORT: Provide the COR the following information for purchases of items listed in Section 13.7, "Use of Products Containing Recovered Material":

   (1) Quantity and cost of listed items <u>with</u> recovered material content and quantity and cost of listed items <u>without</u> recovered material content after completion and prior to submittal of final invoice.

   (2) Written justification 7 days prior to purchase of listed items if recovered material content products are not available: 1) competitively within a reasonable time frame; 2) that meet performance criteria defined in the Standards or Project Specifications; or 3) at a reasonable price.

3. RECLAIMED REFRIGERANT RECEIPT: A receipt from the reclaimer stating that the refrigerant was reclaimed, the amount and type of refrigerant, and the date shall be submitted to the COR after completion and prior to submittal of final invoice in accordance with Section 13.8.5, “Refrigerants And Receipts”.

4. WASTE MATERIAL QUANTITY REPORT: Submit quantities of total project waste material disposal as listed below to the COR after completion and prior to submittal of final invoice in accordance with Section 13.8.8, “Waste Material Quantity Report”.

   (1) Sanitary Wastes: Volume in cubic yards or weight in pounds.

   (2) Hazardous or Universal Wastes: Weight in pounds.

   (3) PCB Wastes: Weight in pounds.

   (4) Other regulated wastes (e.g., lead-based paint or asbestos): Weight in pounds (specify type of waste in report).

5. SPILL PREVENTION NOTIFICATION AND CLEANUP PLAN (Plan): Submit the Plan as described in Section 13.10.2, "Spill Prevention Notification and Cleanup Plan”, to the COR for approval 14 days prior to start of work. Approval of the Plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

6. TANKER OIL SPILL PREVENTION AND RESPONSE PLAN: Submit the Plan as described in Section 13.10.3, "Tanker Oil Spill Prevention and Response Plan”, to the COR for approval 14 days prior to start of work. Approval of the Plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

7. PESTICIDE USE PLAN: Submit two copies of a pesticide use plan as described in Section 13.11.3, “Pesticide Use Plan”, to the COR for approval 14 days prior to use. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. Within seven days

after application, submit a written report in accordance with Standard 2 – Sitework, Section 2.1.1.5, "Soil-Applied Herbicide".

8. TREATED WOOD POLE AND MEMBERS RECYCLING CONSUMER INFORMATION RECEIPT: Submit treated wood pole and members consumer receipt forms to the COR after completion and prior to submittal of final invoice (see 13.12, "Treated Wood Poles and Members Recycling or Disposal").

9. PREVENTION OF AIR POLLUTION: Submit a copy of permits, if required, from Federal, State, or local agencies to the COR 14 days prior to the start of work.

10. ASBESTOS LICENSES OR CERTIFICATIONS: Submit a copy of licenses and/or certifications for asbestos work as described in 13.14, "Handling and Management of Asbestos Containing Material" paragraph a., to the COR prior to work. Submit copies of certificates of disposal and/or receipts for waste to the COR after completion and prior to submittal of final invoice.

11. LEAD PAINT NOTICES: Submit a copy of lead paint notices as described in 13.15, "Material with Lead-based Paint" paragraph b., to the COR upon completion and prior to submittal of final invoice. Submit copies of certificates of disposal and/or receipts for waste to the COR after completion and prior to submittal of final invoice.

12. WATER POLLUTION PERMITS: Submit copies of any water pollution permits as described in 13.16, "Prevention of Water Pollution" paragraph b., to the COR prior to work.

13. PCB TEST REPORT: Submit a PCB test report as described in 13.17, "Testing, Draining, Removal, and Disposal of Oil-filled Electrical Equipment" paragraph b., prior to draining, removal, or disposal of oil or oil-filled equipment that is designated for disposal.

14. OIL AND OIL-FILLED ELECTRICAL EQUIPMENT RECEIPT: Obtain and submit a receipt for oil and oil-filled equipment transported and disposed, recycled, or reprocessed as described in 13.17, "Testing, Draining, Removal, and Disposal of Oil-filled Electrical Equipment", to the COR upon completion and prior to submittal of final invoice.

15. OSHA PCB TRAINING RECORDS: Submit employee training documentation records to the COR 14 days prior to the start of work as described in 13.18.1.

16. CLEANUP WORK MANAGEMENT PLAN: Submit a Cleanup Work Management Plan as described in 13.18, "Removal of Oil-contaminated Material" paragraph b., to the COR for approval 14 days prior to the start of work. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

17. POST CLEANUP REPORT: Submit a Post-Cleanup Report as described in 13.18, "Removal of Oil-contaminated Material" paragraph g., to the COR upon completion and prior to submittal of final invoice.

SECTION 13.2--ENVIRONMENTAL REQUIREMENTS

Comply with Federal, State, and local environmental laws and regulations. The sections in this Standard further specify the requirements.

SECTION 13.3--LANDSCAPE PRESERVATION

1. GENERAL: Preserve landscape features in accordance with the contract clause titled “Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements.”

2. CONSTRUCTION ROADS: Location, alignment, and grade of construction roads shall be subject to the COR's approval. When no longer required, construction roads shall be restored to their original condition. Surfaces of construction roads shall be scarified to facilitate natural revegetation, provide for proper drainage, and prevent erosion. If revegetation is required, then use regionally native plants.

3. CONSTRUCTION FACILITIES: Shop, office, and yard areas shall be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent and prevent impact on sensitive riparian areas and flood plains. Storage and construction buildings, including concrete footings and slabs, shall be removed from the site prior to contract completion. The area shall be regraded as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion. If revegetation is required, then use regionally native plants.

SECTION 13.4--PRESERVATION OF CULTURAL AND PALEONTOLOGICAL RESOURCES

1. GENERAL: Do not remove or alter cultural artifacts or paleontological resources (fossils). Cultural artifacts are of potential scientific or cultural importance and include bones, tools, historic buildings, and features. Paleontological resources can be of scientific importance and include mineralized animals and plants or trace fossils such as footprints. Both cultural and paleontological resources are protected by Federal Regulations during Federal construction projects.

2. KNOWN CULTURAL OR PALEONTOLOGICAL SITES: Following issuance of notice to proceed, Western will provide two sets of plan and profile drawings showing sensitive areas located on or immediately adjacent to the transmission line right-of-way and/or facility. These areas shall be considered avoidance areas. Prior to any construction activity, the avoidance areas shall be marked on the ground in a manner approved by the COR. Instruct employees, subcontractors, and others that vehicular or equipment access to these areas is prohibited. If access is absolutely necessary, first obtain approval from the COR. Ground markings shall be maintained throughout the duration of the contract. Western will remove the markings during or following final cleanup. For some project work, Western will require an archaeological, paleontological or tribal monitor at or near cultural or paleontological site locations. The contractor shall work with the monitor to identify avoidance areas.

3. UNKNOWN CULTURAL OR PALEONTOLOGICAL SITES: On rare occasions cultural or paleontological sites may be discovered during excavation or other earth-moving activities.

   (1) Reporting: If evidence of a cultural or paleontological site is discovered, immediately notify the COR and give the location and nature of the findings. Stop all activities within a 50-foot radius of the discovery and do not proceed with work within that radius until directed to do so by the COR.

   (2) Care of Evidence: Do not damage artifacts or fossils uncovered during construction.

4. CONTRACT ADJUSTMENTS: Where appropriate by reason of delays caused by a discovery, the Contracting Officer may make adjustments to contract requirements.

SECTION 13.5--NOXIOUS WEED CONTROL

1. GENERAL: Comply with Federal, state, and local noxious weed control regulations. Provide a "clean vehicle policy" while entering and leaving construction areas to prevent transport of noxious weed plants and/or seed. Transport only construction vehicles that are free of mud and vegetation debris to staging areas and the project right-of-way.

SECTION 13.6--RECYCLED MATERIAL QUANTITIES

1. GENERAL: Record quantities of the following material by category that is salvaged, recycled, reused, or reprocessed:

   (1) Transformers, Breakers: Weight without oil.

   (2) Electrical Conductors: Length in feet and Type (for example, ACSR, Copper, and gauge).

   (3) Structural Steel: Weight in pounds or tons.

   (4) Aluminum Buswork: Weight in pounds or tons.

   (5) Other Metals: Weight in pounds or tons.

   (6) Oil: Gallons (separate by type - less than 2 ppm PCB, 2 to 50 ppm PCB, and 50 or greater ppm PCB).

   (7) Gravel, Asphalt, Or Concrete: Weight in pounds or tons.

   (8) Batteries: Weight in pounds.

   (9) Wood Poles and Crossarms: Weight in pounds.

   (10) Cardboard. Weight in pounds.

   (11) Porcelain insulators. Weight in pounds.

2. RECYCLED MATERIAL QUANTITY REPORT: Submit quantities for recycled material listed above to the COR after completion and prior to submittal of final invoice.

SECTION 13.7--USE OF PRODUCTS CONTAINING RECOVERED MATERIAL AND BIOBASED PRODUCTS

1. PRODUCTS CONTAINING RECOVERED MATERIAL: If the products listed below are obtained as part of this project, purchase the items with the highest recovered material content possible unless recovered material content products are not available: 1) competitively within a reasonable time frame; 2) that meet performance criteria defined in the Standards or Project Specifications; or 3) at a reasonable price.

   (1) Construction Products:

   - Building Insulation Products
   - Carpet
   - Carpet cushion
   - Cement and concrete containing coal fly ash, ground granulated blast furnace slag, cenosperes, or silica fume

- Consolidated and reprocessed latex paint
- Floor Tiles
- Flowable fill
- Laminated Paperboard
- Modular threshold ramps
- Nonpressure pipe
- Patio Blocks
- Railroad grade crossing surfaces
- Roofing materials
- Shower and restroom dividers/partitions
- Structural Fiberboard

(2) Landscaping Products:

- Compost made from yard trimmings or food waste
- Garden and soaker hoses
- Hydraulic Mulch
- Lawn and garden edging
- Plastic lumber landscaping timbers and posts

(3) Non-paper Office Products:

- Binders, clipboards, file folders, clip portfolios, and presentation folders
- Office furniture
- Office recycling containers
- Office waste receptacles
- Plastic desktop accessories
- Plastic envelopes
- Plastic trash bags
- Printer ribbons
- Toner cartridges

(4) Paper and Paper Products:

- Commercial/industrial sanitary tissue products
- Miscellaneous papers
- Newsprint
- Paperboard and packaging products
- Printing and writing papers

(5) Park and Recreation Products:

- Park benches and picnic tables
- Plastic fencing
- Playground equipment
- Playground surfaces
- Running tracks

(6) Transportation Products:

- Channelizers
- Delineators
- Flexible delineators
- Parking stops

- Traffic barricades
- Traffic cones

(7) Vehicular Products:

- Engine coolants
- Rebuilt Vehicular Parts
- Re-refined lubricating oils
- Retread tires

(8) Miscellaneous Products:

- Awards and plaques
- Bike racks
- Blasting grit
- Industrial drums
- Manual-grade strapping
- Mats
- Pallets
- Signage
- Sorbents

(9) For a complete listing of products and recommendations for recovered content, see http://www.epa.gov/cpg/products.htm

2. PRODUCTS CONTAINING RECOVERED MATERIAL REPORT: Provide the COR the following information for purchases of those items listed above:

(1) Quantity and cost of listed items <u>with</u> recovered material content and quantity and cost of listed items <u>without</u> recovered material content after completion and prior to submittal of final invoice.

(2) Written justification 7 days prior to purchase of listed items if recovered material content products are not available: 1) competitively within a reasonable time frame; 2) that meet performance criteria defined in the Standards or Project Specifications; or 3) at a reasonable price.

3. BIOBASED PRODUCTS: If the products listed below are obtained as part of this project, purchase the items with the highest biobased content possible and no less than the percent indicated for each product unless biobased products: 1) are not available within a reasonable period of time, 2) fail to meet performance criteria defined in the Standards or Project Specifications, or 3) are available only at an unreasonable price.

(1) Mobile Equipment Hydraulic Fluids (minimum 24% biobased content)
(2) Urethane Roof Coatings (minimum 62% biobased content)
(3) Water Tank Coatings (minimum 62% biobased content)
(4) Diesel Fuel Additives (minimum 93% biobased content)
(5) Penetrating Lubricants (minimum 71% biobased content)
(6) Bedding, Bed Linens, and Towels (minimum 18% biobased content)

(7) For additional information regarding biobased products, see **<u>http://www.biobased.oce.usda.gov</u>**

4. BIOBASED PRODUCTS REPORT: Provide the COR the following information for purchases of those biobased items listed above:

(1) Quantity and cost of listed items with biobased content and quantity and cost of listed items without biobased content after completion and prior to submittal of final invoice.

(2) Written justification 7 days prior to purchase of listed items if biobased products: 1) are not available within a reasonable period of time, 2) fail to meet performance criteria defined in the Standards or Project Specifications, or 3) are available only at an unreasonable price.

SECTION 13.8--DISPOSAL OF WASTE MATERIAL

1. GENERAL: Dispose or recycle waste material in accordance with applicable Federal, State and Local regulations and ordinances. In addition to the requirements of the Contract Clause "Cleaning Up", remove all waste material from the construction site. No waste shall be left on Western property, right-of-way, or easement. Burning or burying of waste material is not permitted.

2. HAZARDOUS, UNIVERSAL, AND NON-HAZARDOUS WASTES: Manage hazardous, universal, and non-hazardous wastes in accordance with State and Federal regulations.

3. USED OIL: Used oil generated from the Contractor activities shall be managed in accordance with used oil regulations.

4. RECYCLABLE MATERIAL: Reduce wastes, including excess Western material, by recycling, reusing, or reprocessing. Examples of recycling, reusing, or reprocessing include reprocessing of solvents; recycling cardboard; and salvaging scrap metals.

5. REFRIGERANTS AND RECEIPTS: Refrigerants from air conditioners, water coolers, refrigerators, ice machines and vehicles shall be reclaimed with certified equipment operated by certified technicians if the item is to be disposed. Refrigerants shall be reclaimed and not vented to the atmosphere. A receipt from the reclaimer stating that the refrigerant was reclaimed, the amount and type of refrigerant, and the date shall be submitted to the COR after completion and prior to submittal of final invoice.

6. HALONS: Equipment containing halons that must be tested, maintained, serviced, repaired, or disposed must be handled according to EPA requirements and by technicians trained according to those requirements.

7. SULFUR HEXAFLOURIDE (SF6): SF6 shall be reclaimed and not vented to the atmosphere.

8. WASTE MATERIAL QUANTITY REPORT: Submit quantities of total project waste material disposal as listed below to the COR after completion and prior to submittal of final invoice.

   (1) Sanitary Wastes: Volume in cubic yards or weight in pounds.

   (2) Hazardous or Universal Wastes: Weight in pounds.

   (3) PCB Wastes: Weight in pounds.

   (4) Other regulated wastes (e.g., lead-based paint or asbestos): Weight in pounds (specify type of waste in report).

SECTION 13.9--CONTRACTOR'S LIABILITY FOR REGULATED MATERIAL INCIDENTS

1. GENERAL: The Contractor is solely liable for all expenses related to spills, mishandling, or incidents of regulated material attributable to his actions or the actions of his subcontractors. This includes all

response, investigation, cleanup, disposal, permitting, reporting, and requirements from applicable environmental regulation agencies.

2. SUPERVISION: The actions of the Contractor employees, agents, and subcontractors shall be properly managed at all times on Western property or while transporting Western's (or previously owned by Western) regulated material and equipment.

SECTION 13.10--POLLUTANT SPILL PREVENTION, NOTIFICATION, AND CLEANUP

1. GENERAL: Provide measures to prevent spills of pollutants and respond appropriately if a spill occurs. A pollutant includes any hazardous or non-hazardous substance that when spilled, will contaminate soil, surface water, or ground water. This includes any solvent, fuel, oil, paint, pesticide, engine coolants, and similar substances.

2. SPILL PREVENTION NOTIFICATION AND CLEANUP PLAN (Plan): Provide the Plan to the COR for approval 14 days prior to start of work. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. Include the following in the Plan:

   (1) Spill Prevention measures. Describe the work practices or precautions that will be used at the job site to prevent spills. These may include engineered or manufactured techniques such as installation of berms around fuel and oil tanks; Storage of fuels, paints, and other substances in spill proof containers; and management techniques such as requiring workers to handle material in certain ways.

   (2) Notification. Most States and the Environmental Protection Agency require by regulation, that anyone who spills certain types of pollutants in certain quantities notify them of the spill within a specific time period. Some of these agencies require written follow up reports and cleanup reports. Include in the Plan, the types of spills for which notification would be made, the agencies notified, the information the agency requires during the notification, and the telephone numbers for notification.

   (3) Employee Awareness Training. Describe employee awareness training procedures that will be implemented to ensure personnel are knowledgeable about the contents of the Plan and the need for notification.

   (4) Commitment of Manpower, Equipment and Material. Identify the arrangements made to respond to spills, including the commitment of manpower, equipment and material.

   (5) If applicable, address all requirements of 40CFR112 pertaining to Spill Prevention, Control and Countermeasures Plans.

3. TANKER OIL SPILL PREVENTION AND RESPONSE PLAN: Provide a Tanker Oil Spill Prevention and Response Plan as required by the Department of Transportation if oil tankers with volume of 3,500 gallons or more are used as part of the project. Submit the Tanker Oil Spill Prevention and Response Plan to the COR for approval 14 days prior to start of work. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

SECTION 13.11--PESTICIDES

1. GENERAL: The term "pesticide" includes herbicides, insecticides, rodenticides and fungicides. Pesticides shall only be used in accordance with their labeling.

2. ENVIRONMENTAL PROTECTION AGENCY REGISTRATION: Use EPA registered pesticides.

3. PESTICIDE USE PLAN: The plan shall contain: 1) a description of the pesticide to be used, 2) where it is to be applied, 3) the application rate, 4) a copy of the label, and 5) a copy of required applicator certifications. Submit two copies of the pesticide use plan to the COR for approval 14 days prior to the date of intended application. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. Within seven days after application, submit a written report in accordance with Standard 2 – Sitework, Section 2.1.1.5, "Soil-Applied Herbicide".

SECTION 13.12--TREATED WOOD POLES AND MEMBERS RECYCLING OR DISPOSAL

Whenever practicable, treated wood poles and members removed during the project shall be recycled or transferred to the public for some uses. Treated wood poles and members transferred to a recycler, landfill, or the public shall be accompanied by a written consumer information sheet on treated wood as provided by Western. Obtain a receipt form, part of the consumer information sheet, from the recipient indicating that they have received, read, and understand the consumer information sheet. Treated wood products transferred to right-of-way landowners shall be moved off the right-of-way. Treated wood product scrap or poles and members that cannot be donated or reused shall be properly disposed in a landfill that accepts treated wood and has signed Western's consumer information sheet receipt. Submit treated wood pole and members consumer receipt forms to the COR after completion and prior to submittal of final invoice.

SECTION 13.13--PREVENTION OF AIR POLLUTION

1. GENERAL: Ensure that construction activities and the operation of equipment are undertaken to reduce the emission of air pollutants. Submit a copy of permits, if required, from Federal, State, or local agencies to the COR 14 days prior to the start of work.

2. MACHINERY AIR EMISSIONS: The Contractor and subcontractor machinery shall have, and shall use the air emissions control devices required by Federal, State or Local Regulation or ordinance.

3. DUST ABATEMENT: Dust shall be controlled. Oil shall not be used as a dust suppressant. Dust suppressants shall be approved by the COR prior to use.

SECTION 13.14--HANDLING AND MANAGEMENT OF ASBESTOS CONTAINING MATERIAL

1. GENERAL: Obtain the appropriate Federal, State or local licenses or certifications prior to disturbing any regulated asbestos-containing material. Submit a copy of licenses and/or certifications for asbestos work to the COR prior to work. Ensure: 1) worker and public safety requirements are fully implemented and 2) proper handling, transportation, and disposal of asbestos containing material.

2. TRANSPORTATION OF ASBESTOS WASTE: Comply with Department of Transportation, Environmental Protection Agency, and State and Local requirements when transporting asbestos wastes.

3. CERTIFICATES OF DISPOSAL AND RECEIPTS: Obtain certificate of disposals for waste if the waste is a hazardous waste or receipts if the waste is a non-hazardous waste. Submit copies to the COR after completion and prior to submittal of final invoice.

SECTION 13.15--MATERIAL WITH LEAD-BASED PAINT

1. GENERAL: Comply with all applicable Federal, State and local regulations concerning work with lead-based paint, disposal of material painted with lead-based paint, and management of these material. OSHA and General Industry Standards apply to worker safety and right-to-know issues. Federal EPA and State agencies regulate waste disposal and air quality issues.

2. TRANSFER OF PROPERTY: If lead-based paint containing equipment or material is to be given away or sold for reuse, scrap, or reclaiming, a written notice shall be provided to the recipient of the material stating that the material contains lead-based paint and the Hazardous Waste regulations may apply to the waste or the paint in some circumstances. The new owner must also be notified that they may be responsible for compliance with OSHA requirements if the material is to be cut, sanded, abraded, or stripped of paint. Submit a copy of lead paint notices to the COR upon completion and prior to submittal of final invoice.

3. CERTIFICATES OF DISPOSAL AND RECEIPTS: Obtain certificate of disposals for waste if the waste is a hazardous waste or receipts if the waste is a non-hazardous waste. Submit copies to the COR after completion and prior to submittal of final invoice.

SECTION 13.16--PREVENTION OF WATER POLLUTION

1. GENERAL: Ensure that surface and ground water is protected from pollution caused by construction activities and comply with applicable regulations and requirements.

2. PERMITS: Ensure that:

   (1) Streams, and other waterways or courses are not obstructed or impaired, unless the appropriate Federal, State or local permits have been obtained;

   (2) A National Pollutant Discharge Elimination System (NPDES) Permit is obtained if required by State or Federal regulation; and

   (3) A dewatering permit is obtained from the appropriate agency if required for construction dewatering activities.

   (4) Copies of any water pollution permits are submitted to the COR prior to work.

3. EXCAVATED MATERIAL AND OTHER CONTAMINANT SOURCES: Control runoff from excavated areas and piles of excavated material, construction material or wastes (to include truck washing and concrete wastes), and chemical products such as oil, grease, solvents, fuels, pesticides, and pole treatment compounds. Excavated material or other construction material shall not be stockpiled or deposited near or on streambanks, lake shorelines, ditches, irrigation canals, or other areas where run-off could impact the environment.

4. MANAGEMENT OF WASTE CONCRETE OR WASHING OF CONCRETE TRUCKS: Do not permit the washing of concrete trucks or disposal of excess concrete in any ditch, canal, stream, or other surface water. Concrete wastes shall be disposed in accordance with all Federal, State, and local regulations. Concrete wastes shall not be disposed on any Western property, right-of-way, or easement; nor on any streets, roads, or property without the owner's consent.

5. STREAM CROSSINGS: Crossing of any stream or other waterway shall be done in compliance with Federal, State, and local regulations. Crossing of some waterways may be prohibited by landowners, State or Federal agencies or require permits.

SECTION 13.17--TESTING, DRAINING, REMOVAL, AND DISPOSAL OF OIL-FILLED ELECTRICAL EQUIPMENT

1. SAMPLING AND TESTING OF INSULATING OIL FOR PCB CONTENT: Sample and analyze the oil of electrical equipment for PCB's. Use analytical methods approved by EPA and applicable State regulations. Decontaminate sampling equipment according to documented good laboratory practices (these can be contractor developed or EPA standards). Use only laboratories approved by Western. The COR will furnish a list of approved laboratories.

2. PCB TEST REPORT: Provide PCB test reports that contain the information below for disposing of oil-filled electrical equipment. Submit the PCB test report prior to draining, removal, or disposal of oil or oil-filled equipment that is designated for disposal.

   - Name and address of the laboratory
   - Description of the electrical equipment (e.g. transformer, breaker)
   - Serial number for the electrical equipment.
   - Date sampled
   - Date tested
   - PCB contents in parts per million (ppm)
   - Unique identification number of container into which the oil was drained (i.e., number of drum, tank, tanker, etc.)

3. OIL CONTAINING PCB: Comply with the Federal regulations pertaining to PCBs found at Title 40, Part 761 of the U.S. Code of Federal Regulations (40 CFR 761).

4. REMOVAL AND DISPOSAL OF INSULATING OIL AND OIL-FILLED ELECTRICAL EQUIPMENT: Once the PCB content of the oil has been identified from laboratory results, the oil shall be transported and disposed, recycled, or reprocessed according to 40 CFR 761 (if applicable), Resource Conservation and Recovery Act (RCRA) "used oil", and other applicable regulations. Used oil may be transported only by EPA-registered used oil transporters. The oil must be stored in containers that are labeled "Used Oil." Use only U.S. transporters and disposal sites approved by Western.

5. OIL AND OIL-FILLED ELECTRICAL EQUIPMENT RECEIPT: Obtain and submit a receipt for oil and oil-filled equipment transported and disposed, recycled, or reprocessed to the COR upon completion and prior to submittal of final invoice.

SECTION 13.18--REMOVAL OF OIL-CONTAMINATED MATERIAL

1. GENERAL: Removing oil-contaminated material includes excavating, stockpiling, testing, transporting, cleaning, and disposing of these material. Personnel working with PCBs shall be trained in accordance with OSHA requirements. Submit employee training documentation records to the COR 14 days prior to the start of work.

2. CLEANUP WORK MANAGEMENT PLAN: Provide a Cleanup Work Management Plan that has been approved by applicable Federal, State, or Local environmental regulation agencies. Submit the plan to the COR for approval 14 days prior to the start of work. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. The plan shall address on-site excavation of contaminated soil and debris and include the following:

   - Identification of contaminants and areas to be excavated
   - Method of excavation
   - Level of personnel/subcontractor training

- Safety and health provisions
- Sampling requirements including quality control, laboratory to be used
- Management of excavated soils and debris
- Disposal methods, including transportation to disposal

3. EXCAVATION AND CLEANUP: Comply with the requirements of Title 40, Part 761 of the U.S. Code of Federal Regulations (40 CFR 761).

4. TEMPORARY STOCKPILING: Excavated material, temporarily stockpiled on site, shall be stored on heavy plastic and covered to prevent wind and rain erosion at a location designated by the COR.

5. SAMPLING AND TESTING: Sample contaminated debris and areas of excavation to ensure that contamination is removed. Use personnel with experience in sampling and, in particular, with experience in PCB cleanup if PCBs are involved. Use analytical methods approved by EPA and applicable State regulations.

6. TRANSPORTION AND DISPOSAL OF CONTAMINATED MATERIAL: The Contractor shall be responsible and liable for the proper loading, transportation, and disposal of contaminated material according to Federal, State, and local requirements. Use only U.S. transporters and disposal sites approved by Western.

7. POST CLEANUP REPORT: Provide a Post-Cleanup Report that describes the cleanup of contaminated soils and debris. Submit the report to the COR upon completion and prior to submittal of final invoice. The report shall contain the following information:

   - Site map showing the areas cleaned
   - Description of the operations involved in excavating, storing, sampling, and testing, and disposal
   - Sampling and analysis results including 1) Name and address of the laboratory, 2) sample locations, 3) sample dates, 4) analysis dates, 5) contents of contaminant (e.g. PCB or total petroleum hydrocarbons) in parts per million (ppm)
   - Certification by the Contractor that the cleanup requirements were met
   - Copies of any manifests, bills of lading, and disposal certificates
   - Copies of correspondence with regulatory agencies that support completion of the cleanup

SECTION 13.19—CONSERVATION OF NATURAL RESOURCES

1. GENERAL: Federal law prohibits the taking of endangered, threatened, proposed or candidate wildlife and plants, and destruction or adverse modification of designated Critical Habitat. Federal law also prohibits the taking of birds protected by the Migratory Bird Treaty Act. “Take” means to pursue, hunt, shoot, wound, kill, trap, capture or collect a protected animal or any part thereof, or attempt to do any of those things.

2. KNOWN OCCURRENCE OF PROTECTED SPECIES OR HABITAT: Following issuance of the notice to proceed, and prior to the start of construction, Western will provide training to all contractor and subcontractor personnel involved in the construction activity. Untrained personnel shall not be allowed in the construction area. Western will provide two sets of plan and profile drawings showing sensitive areas located on or immediately adjacent to the transmission line right-of-way and/or facility. These areas shall be considered avoidance areas. Prior to any construction activity, the avoidance areas shall be marked on the ground in a manner approved by the COR. If access is absolutely necessary, the contractor shall first obtain permission from the COR, noting that a Western and/or other government or tribal agency biologist may be required to accompany personnel and equipment. Ground markings shall be maintained through the duration of the contract. Western will remove the markings during or following final inspection of the project.

3. UNKNOWN OCCURRENCE OF PROTECTED SPECIES OR HABITAT: If evidence of a protected species is found in the project area, the contractor shall immediately notify the COR and provide the location and nature of the findings. The contractor shall stop all activity in the vicinity of the protected species or habitat and not proceed until directed to do so by the COR.

4. CONTRACT ADJUSTMENTS: Where appropriate by reason of delays caused by a discovery, the Contracting Officer may make adjustments to contract requirements.

APPENDIX H
Comparison of Transmission Alternatives Considered

APPENDIX H COMPARISON OF TRANSMISSION ALTERNATIVES CONSIDERED

	Transmission Route Distance	Ground Disturbance	Agricultural Lands	Land Jurisdiction/Ownership	Residences within 0.25 Mile	Miles of Route with Roads and Trails within 500 feet	Miles of Roads and Trails within 500 Feet of Transmission Route	BLM VRM Classes Crossed	Visual Impact	Socioeconomics	Upland Birds	Mule Deer Winter Range	Miles of Habitat Crossed	Overall Biological Impact	Soil Erosion Potential	Geohazards	Cultural Resources	Paleontologic Senstivity	Noise	Dust During Construction	Comments
Transmission Route A (Dec 04)	40.5 miles	Temp. 113 acres Perm. 90 acres	6.1 acres Perm. Loss Ag Land 89.2 acres Perm. Loss Rangeland. Important Farmland - - 1.9 miles CRP -- 0.9 mile	BLM - 6.4 miles State - 16.4 miles County - 0.2 miles Private - 17.5 miles	16	11.5 miles (28 percent)	10.9 miles	6.5 miles Class IV	6.0 miles high impact 12.2 miles moderate impact	Capital cost - $4.8 to $5.6 million Labor cost - $4.9 to $5.6 million	2 Sharp-Tailed Grouse Leks and 1 Sage-Grouse Lek within 2 miles	Loss of 8 acres	Grassland - 29.0 miles Riparian - 1.1 miles	Low	9.3 mi. highly erosive soil 7.7 mi. moderate impacts	>8% slopes - 1.4 miles	3 resources; 2% surveyed	Moderate	Low	480 lbs/ acre/month	Eliminated from further consideration
Transmission Route A (June 06)	41.5 miles	Temp. 89 acres Perm. 109 acres	2.7 acres Perm. Loss Ag Land 105.8 acres Perm. Loss Rangeland Important Farmland - - 2.3 miles CRP -- 3.6 miles	BLM - 11 miles State - 17 miles County - 0.2 miles Private - 13.3 miles	2	10.5 miles (25 percent)	10.0 miles	0.9 miles Class II 10.9 miles Class IV	5.3 miles high impact 12.1 miles moderate impact	Capital cost - $5.0 to $5.7 million Labor cost - $5.0 to $5.7 million	3 Sharp-Tailed Grouse Leks and 1 Sage-Grouse Lek within 2 miles	No Loss	Grassland - 28.4 miles Riaprian - 1.2 miles	Low	10.7 miles of soils with high erosion potential; 30.9 miles of soils with moderate erosion potential	>8% slopes - 1.6 miles	2 resources; 10% surveyed	Moderate	Low	480 lbs/ acre/month	Analyzed in EA
Transmission Route B (Dec 04)	37.1 miles	Temp. 100 acres Perm. 54 acres	5.6 acres Perm. Loss Ag Land 54.1 acres Perm. Loss Rangeland Important Farmland - - 0.9 mile CRP -- 1.5 miles	BLM - 5.3 miles State - 15.3 miles County - 0.0 mile Private - 16.5 miles	14	21.7 miles (58 percent)	22.2 miles	5.5 miles Class IV	3.0 miles high impact 11.6 miles moderate impact	Capital cost - $4.5to $5.1 million Labor cost - $4.5 to $5.1 million	3 Sharp-Tailed Grouse Leks and 2 Sage-Grouse Leks within 2 miles	Loss of 8 acres	Grassland - 23.1 miles Riparian - 0.8 mile	Low	5.8 mi. highly erosive soils 3.9 mi. moderate impacts 0.5 thru Bearpaw Shale	>8% slopes - 0.7 mile	6 resources; 4% surveyed	Moderate	Low	480 lbs/ acre/month	Eliminated from further consideration
Transmission Route C (Dec 04)	34.8 miles	Temp. 100 acres Perm. 59 acres	2.4 acres Perm. Loss Ag Land 58.4 acres Perm. Loss Rangeland Important farmland -- 1.5 miles CRP -- 0.0 acres	BLM - 12.4 miles State - 11.2 miles County - 0.0 mile Private - 11.2 miles	7	21.3 miles (61 percent)	22.0 miles	12.4 miles Class IV	4.4 miles high impact 8.1 miles moderate impact	Capital cost - $4.2 to $4.8 million Labor cost - $4.2 to $4.8 million	3 Sharp-Tailed Grouse Leks and 2 Sage-Grouse Leks within 2 miles	Loss of 16 acres	Grassland - 26.1 miles Riparian - 1.2 miles	Low	7.7 mi. highly erosive soils 4.1 mi. moderate impacts	>8% slopes - 1.0 mile	3 resources; 10% surveyed	Moderate	Low	480 lbs/ acre/month	Eliminated from further consideration
Transmission Route C (June 06)	34.1 miles	Temp. 76 acres Perm. 71 acres	2.7 acres Perm. Loss Ag Land 67.8 acres Perm. Loss Rangeland Important Farmland - 1.7 miles CRP - 0.9 mile	BLM - 12.7 miles State - 10.5 miles County - 0 miles Private - 10.9 miles	1	18.7 miles (55 percent)	19.2 miles	0.9 miles Class II 11.7 miles Class IV	4.9 miles high impact 7.8 miles moderate impact	Capital cost - $4.1 to $4.7 million Labor cost - $4.1 to $4.7 million	3 Sharp-Tailed Grouse Leks and 2 Sage-Grouse Leks within 2 miles	Loss of 23 acres	Grassland - 26.4 miles Riparian - 1.2 miles	Low	8.8 miles of soils with high erosion potential; 25.4 miles of soils with moderate erosion potential;	>8% slopes - 1.1 miles	3 resources; 10% surveyed	Moderate	Low	480 lbs/ acre/month	Analyzed in EA
Transmission Route D (Dec 04)	37.1 miles	Temp. 101 acres Perm. 50 acres	1.3 acres Perm. Loss Ag Land 48.7 acres Perm. Loss Rangeland Important Farmland - 1.6 miles CRP - 0.7 miles	BLM - 19.5 miles State - 3.8 miles County - 0.7 mile Private - 13.1 miles	1	20.8 miles (56 percent)	20.9 miles	1.0 mile Class II 1.5 miles Class III 16.9 miles Class IV	18.9 miles high impact 4.5 miles moderate impact	Capital cost - $4.4 to $5.1 million Labor cost - $4.5 to $5.1 million	3 Sharp-Tailed Grouse Leks and 6 Sage-Grouse Leks within 2 miles	Loss of 5 acres	Grassland - 21.5 miles Riparian - 1.3 miles	Low	11.0 mi. highly erosive soils 4.0 mi. moderate impacts 0.3 thru Bearpaw Shale	>8% slopes - 1.0 mile	12 resources; 13% surveyed	Moderate to high	Low	480 lbs/ acre/month	Eliminated from further consideration
Transmission Route E (Dec 04)	33.1 miles	Temp. 86 acres Perm. 64 acres	3.7 acres Perm. Loss Ag Land 64.0 acres Perm. Loss Rangeland Important Farmland - 1.0 mile CRP - 1.4 miles	BLM - 15.4 miles State - 3.1 miles County - 0.1 mile Private - 14.5 miles	2	14.0 miles (42 percent)	13.7 miles	1.1 miles Class III 14.4 miles Class IV	0.2 mile high impact 12.1 miles moderate impact	Capital cost - $4.1 to $4.7 million Labor cost - $4.0 to $4.6 million	2 Sharp-Tailed Grouse Leks and 3 Sage-Grouse Leks within 2 miles	Loss of 21 acres	Grassland - 14.0 miles Riparian - 1.9 miles	Low	13.4 mi. highly erosive soil 7.8 mi. moderate impacts	>8% slopes - 1.4 miles	6 resources; 11% surveyed	Moderate to high	Low	480 lbs/ acre/month	Eliminated from further consideration