WYOMING INDUSTRIAL DEVELOPMENT INFORMATION AND SITING ACT SECTION 109 PERMIT APPLICATION PIONEER WIND PARK I AND PIONEER WIND PARK II

Prepared for

Pioneer Wind Park I, LLC and Pioneer Wind Park II, LLC
Docket No. DEQ/ISC 10-02

By

Wasatch Wind Intermountain, LLC
2700 Homestead Road, Suite 210
Park City, UT 84098

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EXECUTIVE SUMMARY

Wasatch Wind Intermountain, LLC (WWI), a Delaware limited liability company duly licensed to conduct business in Wyoming, has prepared this permit application in accordance with Wyoming Statute (W.S.) § 35-12-109 of the Industrial Development Information and Siting Act (ISA) (W.S. §§ 35-12-109 et seq.). This application is for the proposed construction and operation of the Pioneer Wind Park I and Pioneer Wind Park II energy facilities (the Projects) near Glenrock, Wyoming.

WWI's wholly-owned affiliates, Pioneer Wind Park I, LLC (PWP I, LLC) and Pioneer Wind Park II, LLC (PWP II, LLC), both duly licensed to conduct business in Wyoming, propose to own, construct and operate the Projects on leased private and Wyoming State Lands located in Converse County, Wyoming. The Projects are as follows:

Pioneer Wind Park I (PWP I)- Thirty-one (31) General Electric (GE) 1.6xle (1.6-megawatt [MW]) wind turbine generators (WTGs) for a total nameplate capacity of 49.6 MW, and

Pioneer Wind Park II (PWP II)- Thirty-one (31) GE 1.6xle WTGs for a total nameplate capacity of 49.6 MW.

The Projects will include all aspects of engineering, project planning, site surveying, purchase, and construction of all equipment and facilities necessary for a fully operational wind energy electrical generation project. The Projects will be executed with an engineering, procurement and construction (EPC) contractor(s) with expertise in the wind energy industry. WWI's wholly-owned affiliates will team with this EPC contractor(s) to ensure the timely procurement, delivery and construction of major equipment such as WTGs, and timely procurement, delivery and construction of main power transformers, transmission towers and conductors, cable, and breakers.

The application includes the information required by W.S. § 35-12-109 as well as the rules and regulations implementing the ISA. The Letter of Transmittal has been submitted under separate cover to the Wyoming Department of Environmental Quality (WDEQ), Industrial Siting Division (ISD), along with the application fee.

ISA STATUTE AND COST

A Jurisdictional Meeting was held with the ISD on May 4, 2010. In this meeting, ISD staff determined that the Projects fall under the jurisdiction of the ISD because the estimated capital costs of construction exceed the current statutory jurisdictional capital construction cost threshold of $178.3 million (W.S. § 35-12-102 (vii)) and also contemplates construction of more than 30 WTGs (W.S. § 35-12-102 (vii)(E)(I)).

LOCATION

The project area is located in Converse County, Wyoming. The northern extent of the project area (the transmission interconnect location) is located approximately six miles south of Glenrock, Wyoming. Elevations throughout the project area vary from approximately 5,500 feet to 7,000 feet above mean sea level. Interstate 25 runs approximately four miles north of the project area. There are several improved, unpaved roads within the project area, the most prominent being Mormon Canyon Road (County Road CR-18). The project area is relatively undeveloped, is mainly used for ranching, and contains an approximately quarter-acre open-pit rock quarry.

LAND USE

The proposed Projects and associated transmission interconnection corridor will be located on leased private fee and Wyoming State School Trust lands in Converse County. The project area includes portions of Mormon Canyon Road (Converse County Road CR-18) and at least seven smaller gravel and dirt roads. Lands within the project area are primarily used for ranching (i.e., cattle grazing) and also support some hunting. Following project construction, these uses would continue at the discretion of the landowners while the Projects provide additional income for the leasing landowners. The Projects do not involve any federally owned or managed lands. Prior to initiating development of state lands, PWP I, LLC and PWP II, LLC will pursue Wind Energy Lease Agreements from the State of Wyoming Board of Land Commissioners.

COMPONENTS

The principal components of the Projects include WTGs mounted on three-section tubular towers, transformers, electrical collector lines, fiber optic communication cables, access roads, meteorological

towers, a supervisory control and data acquisition (SCADA) system, an aviation obstacle lighting control system, an operations and maintenance building, an approximately five-mile long 230-kV transmission line and a temporary concrete batch plant (only utilized onsite during construction).

WWI's wholly-owned affiliates will have oversight of the project planning and scheduling, permitting, wind turbine generator supply and delivery, the balance of plant engineering, cost control, evaluation of proposals and equipment, construction, commissioning, testing, and operation of the facility. The selection of the engineering, procurement and construction (EPC) contractor(s) is currently underway.

CONSTRUCTION SCHEDULE

WWI initiated preliminary geotechnical investigation and survey work in June 2010. This work, as well as other site planning and investigation activities have been ongoing since that time. The construction of the projects will take place in two phases separated by six months. PWP I is anticipated to begin construction in June 2011 and will include building 31 WTGs and necessary support buildings, access roads and transmission lines over approximately six months. Construction of PWP II will include erecting 31 WTGs over an approximately five-month period, with construction anticipated to start in July 2012. Commercial operation of PWP I is planned to begin in December 2011 and PWP II is planned to begin commercial operation in December 2012.

All required construction permits will be obtained prior to the initiation of construction. Access roads for PWP I and much of PWP II are anticipated to be constructed during July and August of 2011. All other pertinent structures for PWP I (substation, O&M building, tower foundations, etc) will be built between mid-July and mid-October, 2011. Additional road construction necessary for PWP II will be completed in July and August 2012 with turbine erection and the construction of related infrastructure completed for PWP II between mid-July and mid-October of 2012.

CONSTRUCTION AND OPERATION WORKFORCE REQUIREMENTS

The workforce is anticipated to involve up to 168 workers in more than 20 different trades during the peak construction period of PWP I and up to 145 workers during peak construction period of PWP II.

TRANSPORTATION

Workforce and delivery vehicles are expected to use Interstate 25, the East Glenrock Exit (Exit No. 160), State Highway 20 (Birch Street), and County Road (CR) 18 (Mormon Canyon Road) to access the project area. Interstate 25, Wyoming State Highway 91 (Cold Springs Road) and CR-14 (Windy Ridge Road), or CR-17 (Box Elder Road), and CR-18 is an alternative route pending county and WYDOT road use agreements. Workforce vehicles may also access the project area via Interstate 25 and the Deer Creek Road Exit (Exit No. 160) in Glenrock. The WTGs, steel tubular towers, and electrical collector lines will be trucked to the project area. Access for turbine and tower deliveries requiring wider trucks and/or higher overhead clearance will be coordinated with the Wyoming Department of Transportation (WYDOT) to help mitigate possible disruptions to traffic and to ensure local traffic safety.

Transportation routes associated with oversized loads will be finalized with WYDOT. With coordination from WYDOT, oversized deliveries will avoid planned road and bridge improvement projects. Construction trucks are expected to access the project area via Mormon Canyon Road as described above. WWI's wholly owned affiliates will coordinate delivery of oversized loads with local school districts to limit potential conflicts with any daily school bus transportation operations.

PUBLIC INVOLVEMENT ACTIVITIES

During the May 4, 2010, ISD Jurisdictional Meeting for the proposed Projects, ISD staff determined that the area of site influence for the project should include Converse and Natrona Counties. Based on that determination, WWI developed and actively maintains an on-going communications program to engage county and municipal governments, school districts, joint powers boards, interested organizations and groups and residents in the two counties. The purpose of the communications program is to proactively provide information about wind energy generation in general, the proposed Projects, answer questions about the projects and their effects, collect feedback and identify issues, concerns and opportunities to consider during planning, development and operation of the project.

To date, the communication efforts have included contact with, meetings and notifications to the governmental bodies of Converse County and the communities of Glenrock, Douglas, Rolling Hills and Lost Springs; Natrona County and the communities of Casper, Bar Nunn, Evansville and Mills; Converse County School Districts #1 and #2; Natrona County School District #1; and the Joint Powers Boards in

both Converse and Natrona Counties. WWI has also provided information and notifications to other interested organizations such as economic development organizations, conservation districts and community groups.

Our communications program is proactive and ongoing. We will continue to meet with the two county commissions and the city and town councils of the affected municipalities and with community organizations and groups that express any interest in project updates and participating in project planning.

In addition to these local government and organizational contacts, WWI has met with various State agencies including the Office of the Governor, the State Engineer's Office, the Wyoming Department of Transportation, the Wyoming Game and Fish Department (WGFD), Wyoming Office of State Lands and Investments (OSLI), the Wyoming State Historic Preservation Office, the Wyoming Department of Revenue and the U.S. Fish and Wildlife Service regarding the Projects. Additionally the Wyoming Department of Employment, Wyoming Department of Family Services and local offices of the Department of Workforce Services and Wyoming Highway Patrol were contacted by telephone. We will continue to meet with these and any other interested state and federal agencies on a regular basis and as requested.

We have developed a number of other public and community communication initiatives including a project website at www.pioneerwindpark.com and a public open house in Glenrock on November 9, 2010. We advertised this event in Converse and Natrona newspapers and via email and regular mail. We continue to invite all interested parties to contact us for information about the Projects and to give us their ideas, input and thoughts about the two proposed wind parks and their potential effects.

SOCIOECONOMIC ASSESSMENT

The socioeconomic impact assessment evaluated the benefits and potential adverse impacts to the social and economic resources in the study area and recommended area of site influence. To assess potential effects, the socioeconomic analysis compared the expected future conditions in the recommended area of site influence with and without the Projects. The study area was defined by ISD staff as comprising Converse and Natrona Counties. After review of residency patterns of previous Converse County wind energy projects and consultation with ISD staff, WWI recommends that the Area of Site Influence for socioeconomic effects include the area surrounding the proposed Projects and the Converse County

communities of Glenrock, Douglas and Rolling Hills and the Natrona County communities of Casper, Evansville, Mills and Bar Nunn (see Figure 5-3). WWI also recommends that Glenrock, Douglas, Rolling Hills, Casper, Evansville, Bar Nunn and Mills be designated as local governments primarily affected by the proposed Projects.

Local communities and the state will realize benefits from the Projects, including short-term and long-term jobs, support for businesses through spending on goods and services, local and state tax revenues, and expansion of renewable energy generation in the region. Total projected revenues generated by the proposed Projects during construction and the for the first 10 years of operation, derived by summing the projected tax revenues, would be between $10.7 million and $17.2 million. The range reflects the uncertainties associated with the future assessments for ad valorem tax purposes and the actual annual electrical output delivered to the grid. These revenues represent fiscal benefits that would accrue to public entities in conjunction with the project. Revenue accrual would continue beyond 10 years, particularly revenues derived from the wind energy tax. Increases in public expenditures would offset some of the revenues, but such expenditures would likely be minor due to the limited incremental demands on public facilities and services from the Project. Other economic benefits of the Projects will include land lease revenues to private landowners and the State of Wyoming.

Due to the relatively small size of the construction workforce and the fact that there would be two separate projects separated by six months, the Projects are expected to place limited demands on emergency response, fire suppression, law enforcement, emergency medical care, and other local government services. Similarly, the Projects are not anticipated to substantially affect water, wastewater, or other public infrastructure in affected communities.

ENVIRONMENTAL IMPACT ANALYSES

WWI has reviewed existing data and is in the process of conducting its own detailed wildlife studies and habitat evaluations in the project area. Wildlife studies were initiated in February 2010 and will continue for two years. Wildlife monitoring will then continue for three years after completion of construction. Cultural resource surveys were completed in mid-November 2010. Resource analyses pertaining to soils and geology, wetlands and other waters of the U.S., as well as other studies have been completed to document and characterize baseline conditions of the project area and to assess potential Project-related

effects. These assessments have allowed WWI to site WTGs and other project facilities in areas that will avoid or minimize the potential for environmental resource impacts.

The Projects are located outside the Greater Sage-Grouse Core Areas identified in the Governor's Executive Order 2010-4. A portion of PWP I is located in WGFD-designated crucial winter range for mule deer but due to the relatively high elevation of this area and the associated lack of winter mule deer use, this has not been identified as a major concern by the WGFD. Nonetheless, PWP I, LLC and PWP II, LLC will adhere to WGFD restrictions on timing of construction in this area. WWI has sited all project infrastructure and planned the proposed construction schedule to avoid or minimize potential impacts to wildlife resources. WWI continues to coordinate with WGFD regarding wildlife within the project area.

WWI has sited infrastructure to eliminate or minimize the risk of discharge of dredged or fill materials into stream channels and wetlands. Further micro-siting of the Projects' features during the final design phase will avoid or further reduce potential impacts to jurisdictional waters to the extent practicable. WWI has minimized the number of ephemeral stream crossings and, where complete avoidance is not practicable, PWP I, LLC and PWP II, LLC will obtain a Clean Water Act Section 404 permit and mitigate impacts to waters of the U.S. in accordance with that permit process. The nearest perennial water body to the two Projects is Willow Creek, which traverses the project area from west to east, separating PWP I and PWP II into two qualifying facilities under federal law. Willow creek is located approximately one mile from the nearest PWP I WTG and 0.5 mile from the nearest PWP II WTG. Construction best management practices (BMPs) and micro-siting of the facilities are designed to minimize risk of erosion or discharge into the nearby streams and wetlands and no significant direct or indirect impact to fisheries and aquatic life resources are anticipated to occur during construction and/or operation of the Projects.

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LIST OF ACRONYMS AND ABBREVIATIONS

AADT	Annual average daily traffic
AASHTO	American Association of State Highways and Transportation Officials
AC/DC	Alternating current and direct current
ac-ft	Acre-feet
ac-ft/yr	Acre-feet/year
ACHP	Advisory Council on Historic Preservation
ADA	*Americans with Disabilities Act*
amsl	Above mean sea level
APLIC	Avian Power Line Interaction Committee
AQD	Air Quality Division
AWEA	American Wind Energy Association
BC&A	Bowen Collins & Associates
BEA	U.S. Bureau of Economic Analysis
BGEPA	*Bald and Golden Eagle Protection Act*
bgs	Below ground surface
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BMP	Best management practice
BOP	Balance of plant
CAEDA	Casper Area Economic Development Association
CANDO	Converse Area New Economic Development Organization
CCCD	Converse County Conservation District
CEPI	Civil Environmental Professionals, Inc.
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
CIP	Capital Improvement Plan
cm	Centimeter
CWA	*Clean Water Act*
dB	Decibel
dBA	A-weighted decibel
DEM	Digital Elevation Model
DFGD	Dry flue gas desulfurization
DNV	Det Norske Veritas
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
E & S	Erosion and Sedimentation
EHS	Environmental, Health, and Safety
EIA	Energy Information Administration
EISA	*Energy Independence and Security Act of 2007*
EMF	Electromagnetic field
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
E.O.	Executive Order
EPA	U.S. Environmental Protection Agency
EPC	Engineering-Procure-Construct
E-stop	Emergency stop
ESA	*Endangered Species Act*

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

ESP	Electrostatic precipitator
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FEPCA	*Federal Environmental Pesticide Control Act of 1972*
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FIFRA	*Federal Insecticide, Fungicide, and Rodenticide Act of 1947*
FIRM	Federal Insurance Rate Map
ft	Foot/feet
ft^2	Square foot/feet
FMV	Fair market value
FTE	Full-time equivalent
FY	Fiscal year
GDP	Gross domestic product
GE	General Electric Company
GIS	Geographic information system
GL	Germanischer Lloyd
gpd	Gallon per day
gpm	Gallon per minute
GPS	Global Positioning System
GSU	Generator Step-up
hp	Horsepower
I-25	Interstate 25
I-80	Interstate 80
IBC	International Building Code
IEC	International Electrotechnical Commision
IMPLAN	Impact Analysis for Planning (model)
I-O	Input-output
IRP	Integrated Resource Plan
ISA	*Industrial Development Information and Siting Act*
ISC	Industrial Siting Council
ISD	Industrial Siting Division
ISO	International Organization for Standardization
JPB	Joint Powers Board
K	Soil Erodibility Factor
km	Kilometer
KOP	Key observation point
Ksat	Saturated hydraulic conductivity
kV	Kilovolt
lb	Pound
Leq	Equivalent sound level
Ldn	Day-night sound level
LF	Low frequency
LGIA	Large Generator Interconnection Agreement
Ln	Statistical noise level
LOS	Level of service
m	Meter

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

m^2	Square meter
MBTA	*Migratory Bird Treaty Act*
MCE	Maximum considered earthquake
met	Meteorological
MG	Million gallons
mm	Millimeter
MSW	Municipal solid waste
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NEPA	*National Environmental Policy Act*
NEPDG	National Energy Policy Development Group
NERC	North American Electric Corporation
NFPA	National Fire Protection Agency
NHD	National Hydrological Dataset
NHPA	*National Historic Preservation Act*
NIOSH	National Institute for Occupational Safety and Health
NLRA	Northern Laramie Range Alliance
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSO	No Surface Occupancy
NTIA	National Telecommunications and Information Administration
NWI	National Wetland Inventory
O&M	Operations and maintenance
OES	Occupational Employment Statistics
OSLI	Wyoming Office of State Lands and Investments
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated biphenyl
PCE	Personal consumption expenditure
PFYC	Potential Fossil Yield Classification
P.L.	Public Law
PPA	Power purchase agreement
PURPA	*Public Utilities Policy Act*
Projects	Pioneer Wind Park energy projects
PWP	Pioneer Wind Park
PWP I	Pioneer Wind Park I
PWP I LLC	Pioneer Wind Park I, LLC
PWP II	Pioneer Wind Park II
PWP II LLC	Pioneer Wind Park II, LLC
PWPLLC	Pioneer Wind Park, LLC
REAL	Renewable Energy Alliance of Landowners
REC	Renewable energy credit
REMI	Regional Economic Models, Inc.
REPP	Renewable Energy Policy Project
RERT	Regional Emergency Response Team

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

RFP	Request for Proposals
RLA	Reconnaissance Level Assessment
RMP	Rocky Mountain Power
rpm	Revolutions per minute
RPS	Renewable portfolio standard
RUSLE	Revised Universal Soil Loss Equation
RV	Recreational vehicle
SCADA	Supervisory control and data acquisition
SEO	State Engineer's Office
SHPO	State Historic Preservation Office
SO_2	Sulfur dioxide
SPCC	Spill Prevention, Control and Countermeasure Plans
SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee
TMDL	Total Maximum Daily Load
TRC	TRC Environmental Corporation
UI	Unemployment insurance
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USLE	Universal Soil Loss Equation
VCI	Vapor corrosion inhibitor
VDI	Verein Deutscher Ingenieure
WAQRS	Wyoming Air Quality Standards and Regulations
WARSSS	Watershed Assessment of River Stability and Sediment Supply
WDEQ	Wyoming Department of Environmental Quality
WDOR	Wyoming Department of Revenue
WECC	Western Electricity Coordinating Council
WIEC	Wyoming Industrial Energy Consumers
WEST	Western Ecosystems Technology
WECS	Wind Energy Conversion System
WGFD	Wyoming Game and Fish Department
WHDP	Wyoming Housing Database Partnership
WQD	Water Quality Division
W.S.	Wyoming Statute
WSEO	Wyoming State Engineer's Office
WSGS	Wyoming State Geological Survey
WTG	Wind turbine generator
WWDC	Wyoming Water Development Commission
WWI	Wasatch Wind Intermountain, LLC
WYDOT	Wyoming Department of Transportation
WYNDD	Wyoming Natural Diversity Database
WYO	Wyoming State Highway

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

WYPDES	Wyoming Pollutant Discharge Elimination System
WYR	Wyoming Register
WYSHPO	Wyoming State Historic Preservation Office
yd^2	Square yard
yd^3	Cubic yard

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1.0 PURPOSE, NEED, AND BENEFIT

1.1 PURPOSE

Wasatch Wind Intermountain, LLC (WWI) is an independent power producer organized as a Delaware limited liability company and is the parent and sole owner of Pioneer Wind Park, LLC (PWPLLC), Pioneer Wind Park I, LLC (PWP I, LLC), and Pioneer Wind Park II, LLC (PWP II, LLC). PWP I, LLC and PWP II, LLC will be the direct owners of the two proposed Projects, each project being a separate facility under federal law. WWI, through its affiliates, developed the first commercial wind energy facility in Utah, the Spanish Fork Wind Park, which began commercial operation in June 2008.

The objective of WWI's wholly-owned affiliates, PWP I, LLC and PWP II, LLC is to construct, own, and operate a wind energy facility in Converse County, Wyoming, and to generate revenue for WWI via the sale of clean, economical, safe, renewable wind energy produced by the proposed wind energy facility. PacifiCorp, which operates Rocky Mountain Power, will purchase the energy produced by PWP I and PWP II as part of two, 20-year power purchase agreements. The output of PWP I and II will each add up to 49.6 MW of clean renewable electrical energy to Rocky Mountain Power's regional transmission grid.

Recent national (ex. Energy Information Administration, EIA) and regional forecasts project long-term increases in the consumption of electrical energy into the future. The increases in consumption require the development of new electrical generation facilities to satisfy demand. Through declared federal and state policies, renewable energy generation is a critical element in meeting this rising demand. For example:

- *The Energy Policy Act of 2005* (P.L. 109-58), Section 211, states "It is the sense of the Congress that the Secretary of the Interior should, before the end of the 10-year period beginning on the date of enactment of this Act, seek to have approved non-hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity." The Act encourages the development of renewable energy resources, including wind energy, as part of an overall strategy and policy to develop a diverse portfolio of domestic energy suppliers for the future. The construction and operation of these Projects contributes to increasing and renewable domestic energy production.

- The Energy Information Administration (EIA), a statistical agency of the U.S. Department of Energy (DOE), predicts in its Annual Energy Outlook (March 2009) that total electricity demand will grow by an average 0.5 percent per year from 2006 through 2030, with total renewable generation growing by 3.3 percent per year from 2006 through 2030 (DOE/EIA 2009). The rapid growth of the latter reflects the impacts of the renewable fuel standard in the Energy Independence and Security Act of 2007 (U.S. Congress 2007) as well as strong growth in the use of renewable electricity generation spurred by renewable portfolio standard (RPS) programs at the state level (DOE/EIA 2009).

- On March 11, 2009, Secretary of the Interior Ken Salazar signed Order No. 3285 - Renewable Energy Development by the U.S. Department of the Interior (DOI) (U.S. Secretary of the Interior 2009), which establishes the development of renewable energy as a priority for the DOI. Encouraging the production, development, and delivery of renewable energy is now among the DOI's highest priorities. Although the Projects would not involve any DOI lands, Order No. 3285 exemplifies the federal government's energy policy supporting renewable energy.

- The National Energy Policy Development Group (NEPDG) (National Energy Policy Development Group 2001) recommended to the President, as the National Energy Policy, that the Departments of the Interior, Energy, Agriculture, and Defense work together to increase energy production.

- To address increased interest in wind energy development and to promote implementation of the National Energy Policy recommendation to increase renewable energy production, the Bureau of Land Management (BLM) established a wind energy development program. The program, which included multiple land use plans, supported the Congressional direction provided in the *Energy Policy Act of 2005* regarding renewable energy development on public lands, the directives of Executive Order (E.O.) 13212 - Actions To Expedite Energy-Related Projects, May 18, 2001, and the recommendations of the NEPDG. Although the proposed Projects would not involve BLM-managed lands, this policy demonstrates the goal of supporting renewable energy projects such as wind facilities.

- In 2004, The Western Governors' Association set a goal of developing 30,000 MW of clean energy by 2015 from traditional and renewable energy sources (Policy Resolution 04-13, June 2004). This goal was reaffirmed in 2006 by Policy Resolution 06-10, Clean and Diversified Energy for the West (Western Governors' Association 2006).

- In 2009, the Western Governors' Association identified wind power throughout the west as the regions' "largest renewable resource." Furthermore, the WGA recognized that half of the best class 5 through 7 winds in the Western U.S. occur in southern Wyoming (Western Governors' Association 2009).

1.2 NEED

During a collaborative process that stemmed from a 2007 Rocky Mountain Power (RMP) general rate case, the Wyoming Industrial Energy Consumers (WIEC) noted that RMP "was missing an opportunity to acquire cost-effective QF [Qualifying Facility] resources that could assist in meeting Wyoming load growth."[1]. In PacfiCorp's planned 2011 Integrated Resource Plan (IRP) Public Input Meeting presentation, the company projected a 1,601 MW resource gap in 2012, which was expected to grow to 3,852 MW by 2020. WWI proposed two 50 MW (nominal capacity) energy projects to meet this growing need for energy and successfully executed two corresponding power purchase agreements (PPAs) with PacfiCorp-Rocky Mountain Power on June 17, 2010.

The completion of the Projects would underscore WWI's commitment to producing clean renewable energy, help the country move to reduce its dependence on foreign energy, ensure abundant electrical energy resources for Wyoming, while simultaneously providing local jobs and supporting the national call for increased production of renewable energy.

1.3 BENEFITS

Local communities and the state will realize a variety of economic benefits from the Projects, including short-term and long-term jobs, support for businesses through spending on goods and services, local and state tax revenues, and expansion of renewable energy generation in the region. Other benefits will

[1] *Stipulation and Settlement Agreement*, Docket No. 20000-342-EA-09 (August 26, 2009).

include land lease revenues to private landowners and the State of Wyoming. There are also environmental benefits to be realized from operation of the proposed Projects and the ability of Wyoming to provide electrical energy necessary for economic growth and recruitment of technology and data centers. These benefits are described in the sections below.

1.3.1 Economic Benefits

The proposed Projects would result in economic and fiscal benefits for communities and local governments near the project area, for the State of Wyoming, and for the nation as a whole. These benefits would accrue in the form of PWP I and PWP II construction and operations employment and earnings. These earnings, in turn, lead to indirect and induced employment and earnings in communities near the Projects resulting from project and employee spending. Certain local governments would receive tax revenues from equipment and material purchases and construction and operations of the Projects, principally in the form of ad valorem taxes. Landowners, potentially including the State of Wyoming, that have leased land to PWP I, LLC or PWP II, LLC would receive lease and royalty payments. Revenues accruing to the State of Wyoming principally benefit public education. State and local governments would also realize significant revenues from wind energy production taxes. Construction of the Projects therefore helps sustain essential elements of the region's construction industry. The Projects would also help sustain and support the emerging wind energy construction industry in the area. At the national level, the Projects contribute to the wind energy manufacturing industry and to an increase in renewable energy production capacity.

1.3.1.1 Employment and Personal Income

Average construction employment is projected at 96 workers for PWP I and 88 workers for PWP II; peak employment for each project is projected at 168 and 145 workers respectively. Construction of each project would require approximately six months. Based on the level of local hiring achieved by other wind energy projects in the area, the Projects have established a local hiring goal of at least 30 percent of the workforce over the course of construction.

Estimated wage and salary compensation for construction workers employed on the proposed Projects, including a 20 percent allowance for benefits, is expected to total $6,676,800.

Non-local EPC contractor(s) and subcontractor workers will receive housing, per diem and travel allowances. Based on the 30 percent local hire target and duration of on-site activity for the various tasks, an estimated $2,388,240 in such payments would be made during the construction phase of the project. Summing these two components yields total projected labor costs of $9,065,040 during construction.

Based on the prevailing wages and salaries in the industry and the anticipated level of employment, the annual payroll during operations would be approximately $450,000, including the employer-paid FICA, worker's compensation, and contributions to a comprehensive benefit package.

Development of PWP I and PWP II would generate an additional income stream for the ranching operations that own the land on which the WTGs and other project components would be located and for landowners of other lands leased to WWI. For ranchers, the income would be independent of livestock markets, feed and fuel costs or weather conditions, allowing the recipients more economic flexibility in conducting ranch operations, making improvements, and in some cases may help sustain the lands in agricultural use. Given the current configuration of PWP I and PWP II, the Wyoming State Land Board would be included among these landowners. Terms of individual leases are confidential; however, WWI anticipates that annual payments to all lessors would exceed $1.0 million at full production.

As described above, in addition to the direct, or basic, jobs associated with construction and operation of PWP I and PWP II, the Projects would also support a number of indirect and induced jobs in the region. Based on economic data for Wyoming and the construction of wind energy projects, the estimated numbers of such jobs are 48 during construction of PWP I and 40 during construction of PWP II.

Operations and maintenance expenditures in the local economy, along with the consumer expenditures of staff during operations of PWP I and PWP II would support an estimated five indirect and induced jobs elsewhere in the economy over the long-term. Future expenditures of the public sector revenues generated by the project would support additional indirect and induced jobs, many of which would be outside the study area, but the number of such jobs are not estimated as part of this analysis.

1.3.1.2 Fiscal Benefits

The major revenue sources associated with PWP I and PWP II would include local ad valorem (property) taxes on the value of the WTGs and ancillary facilities and state and local sales and use taxes on the

purchases of WTGs and other taxable equipment and supplies by PWPI, LLC and PWP II, LLC, their contractors and employees. Under current law, the Projects will be assessed a $1.00 per megawatt-hour of energy generated annually (W.S. § 39-22-104), subject to an exemption on the first three years of production. Natrona and Converse counties would also realize temporary increases in lodging taxes associated with the seasonal influx of temporary workers during the two-season construction period.

Ad valorem tax revenues are projected under two scenarios that define a range of likely revenues under current assessment practices for wind energy facilities. Total projected ad valorem taxes to be paid in 2012 would be approximately $661,000, based on the completed value of PWP I. Projected taxes to be paid in 2013 would range between $808,000 and $1,238,000; the range reflecting the differences associated with the two approaches as applied to the combined PWP I and II. Over the first ten years of taxation, total ad valorem taxes to be paid on the Projects would range between $4.4 and $9.7 million, based on current tax rates. Of the total, an estimated 13.8 percent would accrue to the Converse County general fund, 5.4 percent to other county purposes, 74.3 percent to support public education, and 6.5 percent to other special districts.

Given the anticipated development schedule for PWP I, purchases of WTGs and other equipment and materials are assumed to be exempt from sales and use taxes under Wyoming's current sales tax exemption, but this is subject to change based on tax bills that are currently before the 2011 State Legislature. Based on the anticipated development schedule, approximately $66.61 million of the project development cost would be subject to sales and use tax. The state sales and use tax rate of four percent would yield total revenue of approximately $2.66 million on those expenditures. Of the sales and use tax proceeds initially accruing to the state, 69 percent is subsequently allocated to the general fund. The remainder, less a one percent administrative fee, would be distributed among local governments with a portion returned to Converse County and local municipal governments.

In addition to the local share of the state's sales and use taxes, Converse and Natrona counties would realize sales and use taxes from their respective one percent general purpose option tax on purchases subject to tax made within their respective boundaries. Total local option sales and use tax receipts from project construction are estimated at just over $666,000. The majority of such receipts would be generated from use tax levied on the purchases of the PWP II WTGs.

Consumer purchases of taxable goods and services by non-local workers in nearby communities would generate additional sales taxes to both the state and to local counties. Assuming $30 in daily taxable expenditures per non-local worker day would yield a total of approximately $64,000 in such taxes during construction.

Total sales and use tax receipts generated directly by the proposed Projects and their workforce would total $3.40 million. Construction of the Projects would also support additional local sales and use tax receipts indirectly through the "multiplier" effect on local incomes, consumer expenditures and circulation of tax revenues by government agencies. However, such revenues are not estimated as part of this analysis.

Converse and Natrona County would also realize lodging tax receipts, derived from their respective three percent tax levied on short-term lodging expenditures by non-local workers during the two-season construction period. Lodging tax receipts in the two counties are estimated to total nearly $18,500 following construction of both Projects.

State and local sales and use taxes would be generated over the life of the project from taxable purchases directly associated with ongoing operations and maintenance of the project, as well as by consumer purchases by its workers and service vendors. Although substantially lower than the revenues associated with construction, these revenues could still be substantial.

The Wind Energy Production tax levies a $1.00 per megawatt-hour tax on electricity produced annually by a commercial wind project. The statute (W.S. § 39-22-104) provides a three-year exemption from the date of initial production. Given that exemption and the current plan of development, full scale taxable production would begin in late 2014 and 2015, for PWP I and PWP II, respectively, yielding estimated annual taxes of $304,000 and $390,000, subject to variation in response to actual production. Forty percent (40 percent) of the revenues generated by this tax will accrue to the state's general fund, with 60 percent to be distributed among counties where generating facilities are located. Total annual receipts accruing to the state general fund for 10 years of taxable production, assuming full development and capacity, would range between $1,216,000 and $1,564,000. Revenues accruing to the local government distribution fund would range between $1,824,000 and $2,346,000.

The distribution mechanism for the local share of these revenues has not been finalized, but it can be expected that a substantial share of the revenue would be distributed to the county where the power was generated, i.e., Converse County. It is, however, uncertain whether a share of the local revenue will flow through to municipalities. Table 1-1 presents estimated local and state tax revenues associated with the proposed Projects.

Table 1-1 Summary of Major Public Sector Revenues Generated by PWP I and PWP II.

Revenue Source	Projected Revenue	Revenues Distributed to:
Local ad valorem/property tax (including mandatory state levies)	$808,000 to $1,238,000 (2013) $61,000 to $145,000 (year 21)	County, local and statewide public education, special service districts. Glenrock, Douglas, and Casper benefit indirectly.
Sales and use tax	$3.39 million during construction Some ongoing revenues based on O&M	State general fund and local government, primarily Converse County, Douglas and Glenrock
Lodging Taxes	Approx. $18,500	Natrona and Converse counties
Wind energy production tax	$304,000 to $391,000 per year at full production	State general fund and local governments, likely to include Converse County

Should a lease be granted for the state lands, the Wyoming State Land Board would realize lease and royalty revenues from state trust lands leased by PWP I, LLC and PWP II, LLC for these projects. Terms of the leases have not yet been finalized, but based upon wind energy production leases on other Wyoming state lands, the eventual revenues could be substantial. These revenues generated from state trust lands benefit public schools and other designated beneficiaries, including the Wyoming Boys School, Girls School, Wyoming Training School and Wyoming State Hospital.

Local governments and other public entities would realize increases in charges for services, fees, and other taxes given the implementation of the Projects. Such revenues would be substantially lower in magnitude than those identified above, but could still be important to the specific entity involved.

Construction of the Projects may result in the generation of impact assistance payments (IAPs) to primarily affected units of local government. Forecasting IAPs is a challenging exercise due to the uncertainty introduced by any economic downturn and its impact on local consumer expenditures, expenditures by the mining industry, and levels of new construction across the state, as they affect estimation of the base period distribution. Yet another complication is how results of the 2010 Census will affect future distributions of state shared revenues and the timing for adopting the revised allocations. Finally, the effect of the tax-exempt status of most purchases associated with PWP I on the availability of IAPs in 2011 and the establishment of the base year and estimation of IAPs for PWP II in 2012 is unclear. Given the uncertainty and other factors cited above, a conservative approach to estimating IAPs seems prudent. Assuming no IAPs associated with PWP I, the estimated construction cost of PWP II, and current distribution of sales and use taxes to Converse County yields an order of magnitude estimate of $50,000 to $100,000 for total IAPs in 2012. However, continued economic weakness in the region that could contribute to declining tax revenues during construction could effectively result in little or no IAPs being available.

1.3.2 Environmental Benefits

Wind power is a renewable and non-polluting source of electricity. Operation of wind energy facilities such as the proposed Projects, produces no direct air emissions and therefore does not contribute to the generation of carbon dioxide, smog, acid rain and snow, mercury contamination, or increased levels of particulate matter in the atmosphere. To the extent that the Dave Johnston coal-fired power plant in Glenrock could be backed down while PWP I and PWP II are producing electricity, the proposed Projects could result in an actual reduction in emissions and improved air quality in the region. Reduced overall emissions could, in turn, benefit the environment within the airshed and reduce adverse health effects typically associated with the production of sulfur and nitric oxides and airborne particulates from coal combustion.

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2.0 APPLICANT AND FACILITY DESCRIPTION

The following section provides information relevant to W.S. § 35-12-109 and the implementing rules and regulations of the ISA which request project-specific information relating to the intention of PWP I, LLC and PWP II, LLC to construct, own and operate the two proposed 31 WTG, 49.6 MW wind energy facilities in Converse County, Wyoming.

2.1 APPLICANT INFORMATION

Applicant:

Pioneer Wind Park I, LLC and Pioneer Wind Park II, LLC
2700 Homestead Rd., Suite 210
Park City, UT 84098

The following manager has been designated by PWP I, LLC and PWP II, LLC to be responsible for permitting of the proposed Pioneer Wind Park I (PWP I) and Pioneer Wind Park II (PWP II) wind energy facilities (the Projects):

Brett Woodard
Chief Financial Officer
2700 Homestead Road, Suite 210
Park City, UT 84098
435-503-8814
bwoodard@wasatchwind.com

PWP I, LLC and PWP II, LLC are wholly owned subsidiaries of Wasatch Wind Intermountain, LLC (WWI), a limited liability company. Pioneer Wind Park I, LLC (PWP I, LLC) and Pioneer Wind Park II, LLC (PWP II, LLC) hold all the assets, permits, supply agreements, and power purchase agreements.

2.1.1 Financial Assurance

2.1.1.1 Company Overview

WWI is a privately funded, independent wind energy developer headquartered in Park City, Utah. The company was formed to uniquely focus on wind energy development in the Intermountain West and

builds on regional successes. The members of WWI have extensive local and national experience developing and funding many successful wind energy projects. WWI's team consists of individuals with decades of hands-on landowner, environmental, and wind energy expertise.

WWI's executives and development team, through an affiliate, were responsible for the development, permitting, design, engineering, and interconnection of Utah's first commercially operating wind farm—Spanish Fork Wind Park (SFWP)—near Spanish Fork, Utah. SFWP was subsequently sold to Edison Mission Group, which constructed the project and began operating it in June 2008. This wind project has a capacity of 18.9 MW and sells the electricity generated to Rocky Mountain Power. The SFWP was several years in the making, and entailed extensive collaboration between the community and state and local governments.

2.1.1.2 Turbine Supply

Pioneer Wind Park I LLC (PWP I, LLC) and Pioneer Wind Park II, LLC (PWP II LLC), wholly owned affiliates of WWI, have signed turbine supply agreements with General Electric (GE) for the provision of 62, 1.6xle wind turbine generators (WTGs) for installation at PWP I and PWP II.

2.1.1.3 Financing Plan

To finance the construction, operation, decommissioning and reclamation of PWP I and PWP II, PWP I, LLC and PWP II, LLC will join with a financial partner that not only understands the nuances of wind farm financing, but also has extensive experience operating wind energy facilities and other energy assets. This financial partner will have the financial capability and be able to provide the financial assurances required under the *Industrial Siting Act*.

2.1.1.4 Construction Contractor

PWP I, LLC and PWP II, LLC will contract with an engineering, procurement and construction (EPC) contractor(s) for construction of the Projects. The final selection of an EPC contractor(s) will be based on the contractor's industry reputation, work quality, and relevant experience—especially in Wyoming. Additional considerations will be its ability to meet the construction schedule while maintaining high standards of safety and quality and its commitment to using local labor and resources wherever possible.

2.1.1.5 Operations and Maintenance Plan

A first-class operations and maintenance (O&M) plan is a critical component contributing to long-term viability of the Projects. PWP I, LLC and PWP II, LLC will either contract with an experienced and reliable third party operations and maintenance provider or, if PWP I, LLC and PWP II, LLC elects to jointly develop the Projects with a partner, use the experienced and reliable in-house O&M team of our partner. PWP I, LLC and PWP II, LLC currently have multi-year, fixed price contract offers for both planned and unplanned O&M from a leading provider of third party O&M services to the wind industry in North America. This third-party provider has decades of O&M experience in the wind industry and thousands of WTGs under contract for its O&M services.

2.1.1.6 Warranty

A full warranty on both the WTGs and balance of plant are also a critical component contributing to long-term viability of the Projects. PWP I, LLC and PWP II, LLC's Turbine Supply Agreements with GE includes a two-year warranty that ensures all equipment is new and free from defects in material, workmanship, and title. The two-year warranty period on a given turbine begins when construction of that turbine is completed. Any turbine repair during this two-year period is then warranted for a period of twelve months from the date of repair or until the end of the original warranty period, whichever is later. Similarly, the EPC contractor(s) that PWP I, LLC and PWP II, LLC selects for constructing the Projects' balance of plant will also warrant its material and workmanship for two years.

In addition to the warranty, the long-term availability of the GE WTGs is expected to be at least 98 percent, based on statistics provided by GE. The GE 1.6xle WTGs have a design life of 25 years, which exceeds the minimum projected operational life of the facilities.

2.1.1.7 Decommissioning and Reclamation

Facility decommissioning and site reclamation are described in detail in Section 3.8. Specific decommissioning and reclamation requirements will be based on PWP I, LLC and PWP II, LLC's commercial agreements with its lessees, Converse County wind energy permit requirements, and the requirements of the ISD. The expected cost to decommission the proposed facilities is $18.8 million. WWI's financial analysis considers these costs as a component in *pro forma* modeling and in the

assessment of these Projects' viability. For the Projects, PWP I, LLC and PWP II, LLC will execute a surety bond or similar mechanism acceptable to the WDEQ to provide financial assurance for reclamation, as required by the statute.

2.2 COMMERCIAL WIND ENERGY FACILITY

Each of the proposed Projects is expected to consist of 31 WTGs and falls under the Wyoming Industrial Siting Act (ISA) statutory definition of an Industrial Facility (W.S. §35-12-102(E)(I)).

2.3 SITE SELECTION

The Project sites were selected for the following reasons:

1. The sites offer commercially viable wind resources based on collected meteorological data from seven meteorological towers that have been erected in the PWP I and PWP II project sites over periods ranging from three months to almost three years;
2. The project area is less than four miles from an existing 230 kV transmission line with available injection capacity and the Projects' 230 kV interconnection line will be completely located within the project areas on acreage owned by a private landowner;
3. The project areas are located outside of the Greater Sage-Grouse Core Areas identified in former Wyoming Governor Freudenthal's Executive Order 2010-04;
4. There are no federally listed threatened and endangered species known to occur in the project areas, and development of the site is not anticipated to adversely affect Wyoming State species of greatest conservation need or result in any other significant environmental impacts;
5. There is strong landowner support to host these Projects: two of the landowners in the project area erected the first meteorological tower in the area in order to collect wind data to encourage commercial wind development;
6. PWPLLC, PWP I, LLC and PWP II, LLC have acquired wind energy leases for 28,867 acres of private land, an area more than sufficient to construct and operate the two 31 WTG (49.6 MW) Projects;
7. The Projects' area is located in close proximity to major transportation corridors;

8. The Projects' area is located in a sparsely populated, rural area—there are only 27 landowners with structures on their property within a five-mile radius of the project sites—thus minimizing disturbance to area residents.

2.4 NATURE AND LOCATION OF THE FACILITY

The proposed Projects are located in Converse County, Wyoming. The northern extent of the project area (the transmission interconnect location) is located approximately six miles south of Glenrock at an approximate elevation of 5,600 feet above mean sea level (amsl). PWP I is located approximately 10 miles south of Glenrock at elevations ranging from about 6,600 feet to 6,860 feet amsl, and PWP II is located approximately 12 miles south of Glenrock at elevations ranging from about 6,860 feet to 7,050 feet amsl. Refer to Map A-1 in Appendix A for the location of the project areas and to Table 2-1 for detailed information on the location of lease lands.

The main access to the Projects will be via Interstate 25 (located about seven miles north of PWP I), East Glenrock Interchange (Exit #160), Birch Street (State Highway 26) and Mormon Canyon Road (County Road 18), which heads southward from Glenrock and bisects the project area.

The project areas are located in a region known as "The Flats" by local residents and are characterized by gently rolling topography, open grasslands and sagebrush-dominated vegetation. There are two perennial streams in the vicinity of the Projects: Willow Creek separates PWP I and PWP II, and Virden Creek is located south of PWP II. The project area is largely undeveloped, mainly used for ranching and hunting and contains one open-pit rock quarry that covers approximately one quarter-acre.

2.5 POINT OF DELIVERY - GOODS AND SERVICES

The construction and operation of the Projects will result in the purchase of goods and services, both for the Project and for the needs of the associated construction and operations workforce. Goods and services procured for construction activities will be obtained from various local, regional, and national vendors. WWI anticipates that the majority of the Projects' components will be trucked to the project site and that Converse County will be the primary point of delivery for these components.

2.6 PRELIMINARY SITE PLAN

WWI has completed a preliminary site plan detailing the WTG layout, location of the transmission line, access roads, the project switchyard (interconnect substation), collector substation and operations and maintenance (O&M) building, temporary and permanent parking areas, and the temporary concrete batch plant. All permanent and temporary facilities detailed in the site plane will be located at least 500 ft from perennial streams including Lone Tree Creek. The site plan is presented as Map A-2 in Appendix A.

2.7 LAND OWNERSHIP

The overall area under consideration for PWP I and PWP II consists of 31,371 acres: 28,867 acres are private fee lands and 2,504 acres comprise State of Wyoming Trust Lands, with the proposed facilities located on much smaller footprints within this area. Regarding the State Trust Lands, WWI has been working with the Office of State Lands and Investments (OSLI) to determine which parcels will be part of the final wind energy lease application. If approved, this lease would allow WWI to place WTGs on State Trust Lands in PWP II. The State Lands included in the lease application are surrounded by or abutting private lands already under lease by PWPLLC, PWP I, LLC or PWP II, LLC. The State Land parcels included in our application are currently being leased for grazing by adjacent private landowners who have signed lease agreements with PWP I, LLC or PWP II, LLC and are supportive of wind power development on these lands.

WWI intends to seek approval of its pending wind energy lease application before the State Board of Land Commissioners at a Board Meeting in 2011. No federal lands will be used for any infrastructure related to the proposed Projects. All leased lands occur in Converse County. Table 2-1 provides the legal description of leased private lands in and around the project area. As noted above, a relatively small portion of these lands is proposed for wind energy development at this time. The proposed development site for PWP I comprises approximately 4,354 acres (14 percent of the leased private and adjacent State Lands) and the PWP II site comprises approximately 7,510 acres (24 percent of leased private and adjacent State Lands). Table 2-2 identifies State Land parcels for which WWI intends to submit a lease application. Map A-3 in Appendix A shows land ownership (private, state, BLM) within the project area.

Table 2-1 Leased Private Lands in and around the Project Area and Transmission Line Corridor.

Township	Range	Section	Description
PWP I			
32 North	75 West	6	Lots 4, 5, 6 and 7 (Now Tract 52); Lot 12 and Tracts 51 A, B, C and D, Tract 58, Lots 8, 9, and 10, SE/4NE/4; SE/4
32 North	75 West	7	Tract 55A, Lots 5, 6, 7 and 8, E/2, E/2W/2
32 North	75 West	8	W/2NW/4
32 North	75 West	17	SW/4SW/4
32 North	75 West	18	Lots 4, 5, 6, 7, 8 and 9, S/2SE/4, SE/4SW/4
32 North	75 West	19	Lots 1, 2, 3, 4, E/2W/2, N/2NE/4, E/2SE/4
32 North	75 West	20	S/2
32 North	75 West	27	Lots 1, 2, 3, 4, 5, 6, 7 and 8, Tract 43
32 North	75 West	28	Lots 1 and 2, NE/4NE/4, W/2NE/4, NW/4SE/4, NW/4, N/2SW/4 Tract 44; (described under original survey as S1/2SW1/4: Section 27) That part of Tract 45, which was described under original survey as E1/2SE1/4: Section 28 Tract 45; that part of Tract 45 that was described under the original survey as SW/4SE/4 of Section 28 and now located in Section 28 and 33; and Lot 3; and S/2SW/4
32 North	75 West	29	ALL
32 North	75 West	30	Lots 1, 2, 3 and 4, E/2W/2, NE/4, N/2SE/4, SW/4SE/4
32 North	75 West	31	Lots 2 and 3, SE/4NW/4, NE/4SW/4, N/2SE/4, NW/4NE/4, S/2NE/4, and 5.0 acres in Lot 4, more particularly described as follows: Beginning at the southwest corner of Section 31, said corner being the common corner to T31 and 32N, R75 and 76W of the sixth principal meridian, thence north 0°23' west a distance of 922.0 feet to the beginning of closed traverse, thence north 0°23' west a distance of 400.0 feet to the northwest corner of the traverse (also northwest corner of Lot 4), thence south 89°38' east a distance of 1089.0 feet. To the northeast corner of traverse, thence south 69°27' west a distance of 1160.0 feet to the point of beginning of the traverse.
32 North	75 West	32	ALL
32 North	75 West	33	NW/4, N/2SW/4, NW/4SE/4, S/2NE/4, Lots 1, 2, 3 and 4
32 North	75 West	34	Tracts 48 and Lots 1, 2, 3 and 4
32 North	76 West	1	Lot 9
32 North	76 West	12	Lots 1, 2 and 3, NE/4SW/4; Tract 56 (formerly SE/4NE/4 and the E/2SE/4 and the SW/4SE/4); Tract 53 Lots B and C of Tract 55

Table 2-1 (Continued)

Township	Range	Section	Description
32 North	76 West	13	Lots 4 and 5
32 North	76 West	18	Tract 57; (described under the original survey as Lots 1 and 2 and NE/4NW/4: of Section18, in Township 32 North, Range 75 West and NE/4NE/4 of Section 13, in Township 32 North Range 76 West of the 6th P.M.) in Section 18, Township 32 North, Range 75 West, and in Section 13, in Township 32 North, Range 76 West of the 6th P.M.
32 North	76 West	23	Lots 5, 6, 8, and 10: Tracts 63A, 63B, 63C and 63D (said Tract 63 de-scribed under the original survey as S/2NE/4: N/2SE/4 Tract 64B in Sections 23 and 24, Tracts 64A, 64C and 64D (said Tract 64 described under the original survey as S/2NW/4: NE/4SW/4: NW/4SE/4 of Section 24)
32 North	76 West	24	Lots 1, 4, 5, 6, 8, 9, 10 and 11
32 North	76 West	25	Lots 1, 2, 3, 4, 5, 6 and 7, SW/4NE/4, NW/4NW/4, S/2NW/4, N/2SW/4, SW/4SW/4, Tracts 46-A, 46-B
32 North	76 West	26	ALL
32 North	76 West	27	E/2NE/4, S/2SW/4NW/4, N/2SW/4, S/2NW/4SE/4
32 North	76 West	28	Lots 1, and 2, SE/4NE/4, SE/4
32 North	76 West	33	Lots 4, 5 and 6, NE/4, N/2SE/4 NE/4SW/4
32 North	76 West	34	Lots 1, 2, 3, 4, and 5, N/2NE/4, SW/4NE/4, W/2NW/4, N/2SW/4, SE/4SE/4 (Now that part of tract 69)
32 North	76 West	35	Lots 1, 2, 3, 4, 5, 6 and 7: W/2NE/4: NW/4: NW/4SE/4 That part of Tract 69 in Sections 34 and 35 which was described under the original survey as NW/4SW/4 of Section 35, SW/4SW/4 (Now that part of Tract 69)
32 North	76 West	1	Lot 9
32 North	76 West	12	Lots 1, 2 and 3, NE/4SW/4; Tract 56 (formerly SE/4NE/4 and the E/2SE/4 and the SW/4SE/4); Tract 53 Lots B and C of Tract 55
32 North	76 West	13	Lots 4 and 5
PWP II			
31 North	75 West	4	Lots 7 and 8
31 North	75 West	5	Lots 1, 2, 3 and 4, S/2N/2
31 North	75 West	6	ALL
31 North	75 West	7	Lots 1 and 2, E/2NW/4
31 North	75 West	8	NE/4
31 North	75 West	9	S/2NE/4, NW/4, S/2
31 North	75 West	10	SW/4NE/4, S/2NW/4, SW/4, W/2SE/4
31 North	75 West	17	NE/4, That part of the NW/4 lying north of the county road 18 known as Mormon Canyon Road

Table 2-1 (Continued)

Township	Range	Section	Description
31 North	75 West	18	Lots 1, 2, 3 and 4, that part of the NE/4:NW/4 and the NE/4 lying north of the County Road 18 known as Mormon Canyon Road
31 North	75 West	19	Lots 1, 2 and 3, NE/4SW/4, N/2SE/4
31 North	76 West	1	Lots 1, 2, 3, 4, SW/4, S/2NW/4, SW/4NE/4, NW/4SE/4, Pt. SW/4SE/4 lying west of the centerline of the Mormon Canyon Road County Road #18, Pt. E/2E/2 lying west of the centerline of the Mormon Canyon Road County Road #18
31 North	76 West	2	Lots 1, 2, 3 and 4, S/2N/2, NE/4SW/4, SE/4
31 North	76 West	3	Lots 1, 2 and 4, S/N/2, S/2
31 North	76 West	4	Lots 1, 2, 3 and 4, S/2N/2, S/2
31 North	76 West	5	S/2SE/4, and that part of the NE/4SE/4 of Section 5 lying South of the drift fence, and more particularly described by metes and bounds as follows, to-wit: Beginning at a point which is 1320 feet North of the SE Corner of Section 5 and which point is the SE Corner of the NE/4SE/4 of Section 5. Thence proceed along the Forty line West 1320 feet to the SW Corner of the NE/4SE/4 Section 5. Thence proceed North along the Forty line 385 feet to the present drift fence. Thence proceed along the drift fence North 79° East 370 feet to a bend in the fence. Thence proceed along the fence North 49° East 355 feet to a bend in the fence. Thence proceed along the fence North 63°30' East 270 feet to a bend in the fence. Thence proceed along the fence South 82° East 345 feet to a point on the East line of the NE/4SE/4 of Section 5. Thence proceed South along the Forty line 768 feet to our point of beginning, the SE Corner of the NE/4SE/4 of Section 5.
31 North	76 West	8	E/2, S/2NW/4, E/2SW/4
31 North	76 West	9	ALL
31 North	76 West	10	ALL
31 North	76 West	11	NE/4, S/2
31 North	76 West	12	NE/4NE/4, S/2NE/4, NE/4SE/4, That part of the NW/4NE/4, W/2SE/4 and SE/4SE/4 lying east of the County Road 18 known as Mormon Canyon Road Pt. NW/4NE/4, and that part of the S/2, lying west of the centerline of the Mormon Canyon Road County Road #18
31 North	76 West	13	ALL
31 North	76 West	14	ALL
31 North	76 West	15	ALL
31 North	76 West	16	ALL
31 North	76 West	17	E/2, E/2W/2, W/2SW/4
31 North	76 West	20	NE/4, E/2SE/4

Table 2-1 (Continued)

Township	Range	Section	Description
31 North	76 West	21	N/2, SE/4, E/2SW/4, SW/4SW/4
31 North	76 West	22	ALL
31 North	76 West	23	N/2NW/4, E/2
31 North	76 West	24	ALL
31 North	76 West	26	N/2, N/2S/2, SW/4SW/4, SE/4SE/4
31 North	76 West	27	ALL
31 North	76 West	28	ALL
Transmission Line Corridor			
32 North	76 West	1	Lots 5, 6, 7 and 8, SW/4NW/4, SE/4NW/4, SW/4
32 North	76 West	11	Lots 1 and 2, S/2SW/4, S/2NE/4, SE/4
32 North	76 West	12	N/2NW/4, SW/4NW/4, NW/4SW/4, S/2SW/4
32 North	76 West	13	Lots 2 and 3, NW/4NW/4, S/2NW/4, SW/4, NW/4SE/4, SW/4SE/4
32 North	76 West	14	N/2, SE/4, N/2SW/4, SW/4SW/4
32 North	76 West	23	Lots 1 and 2
32 North	76 West	24	Lots 2 and 3

Table 2-2 State Lands (Lease Application Pending) within the Proposed Project Area.

Township	Range	Section	Description
PWP I			
32 North	75 West	30	SE/4SE/4
32 North	75 West	31	Lot 1, NE/4NW/4, NE/4NE/4
32 North	76 West	36	Tract 47 (formerly known as Section 36)
PWP II			
31 North	75 West	5	S/2
31 North	75 West	7	Lots 3 and 4, E/2SW/4, E/2
31 North	75 West	8	W/2, SE/4
31 North	76 West	2	S/2SW/4, NW/4SW/4
31 North	76 West	11	NW/4
31 North	76 West	12	NW/4

2.7.1 Mineral Ownership

Within the proposed PWP I and PWP II project sites and the transmission line corridor, there are four different owners of subsurface mineral rights. Two of these owners have unlisted addresses. First-class certified letters providing notice of WWI's intent to construct a wind farm were sent to the two mineral rights holders that have listed addresses. This letter provided a general description of the proposed Projects, a legal description of the areas in which the Projects are located, and the name and phone number of a WWI representative to contact for additional information. In an attempt to notify the other two mineral rights holders without listed addresses, legal notices were published in two local newspapers: the Glenrock Independent (notices appeared on November 18 and December 2, 2010) and the Douglas Budget (notices appeared on November 17 and December 1, 2010). Refer to Appendix B for copies of the notification letters, legal notices and a list of mineral rights holders.

2.8 PROJECT DESCRIPTIONS AND FUTURE MODIFICATIONS

Pioneer Wind Park I and Pioneer Wind Park II are owned by Pioneer Wind Park I, LLC and Pioneer Wind Park II, LLC, respectively. Both are wholly owned affiliates of WWI and hold all the respective assets, permits, supply agreements, and power purchase agreements for the Projects. The size of each project is 49.6 MW. PWP I will entail the construction of 31 WTGs during the 3rd and 4th quarters of 2011. PWP II will consist of another 31 WTGs to be constructed in the 3rd and 4th quarters of 2012. These two Projects correspond with the two *Public Utilities Regulatory Policy Act* (PURPA) qualifying facilities (QFs) identified in PWP I, LLC and PWP II, LLC's power purchase agreements with PacifiCorp-Rocky Mountain Power.

WWI currently has no plans to add additional phases or modify the proposed facilities. If proposed, any future projects would be subject to their own County and ISA permit processes.

2.9 WIND ENERGY FACILITY COMPONENTS

Facilities and related infrastructure associated with the proposed Projects will include WTGs mounted on steel tubular towers, pad-mounted transformers, buried power collection electrical systems and fiber optic communications cables. Access roads, meteorological (met) towers, a supervisory control and data acquisition (SCADA) system, and an operations and maintenance (O&M) building will also be

constructed. A single substation serving both Projects will be constructed onsite. An approximately five mile-long 230 kV transmission line will extend north-northwest from this substation to an electrical switchyard where it will interconnect with Rocky Mountain Power's existing 230 kV transmission line, which extends southwest from the Dave Johnston Power Plant.

2.9.1 Wind Turbine Generators

The Projects will each install and erect 31 GE 1.6-MW xle WTGs. The GE 1.6xle is a three-blade, active yaw and pitch, regulated machine with power and torque control capabilities. The rotor diameter is 270.7 ft (82.5m), the height at the hub is expected to be 262.4 ft (80 m) (see Figure 2-1). The rotor-swept area is 6,393 yd2 (5,345 m^2) and the rotor typically operates at up to 20 revolutions per minute (rpm). The WTG will start to operate when the 10-minute average wind speed is 7.8 miles per hour (mph). To minimize strain on the turbine blades and gear box and other turbine components, the WTG will stop operating when the 10-minute average wind speed is 55.9 mph or greater.

The WTGs will be mounted on a poured-concrete spread-foot foundation. They will be spaced at distances generally ranging from two and a half to four rotor diameters between WTGs within a turbine row, and at least eight rotor diameters between turbine rows, depending on the characteristics of the specific turbine location. Refer to Appendix A for a map of the proposed site plan and preliminary turbine layout.

2.9.1.1 Rotor Blades

The rotor for a GE wind turbine is made of three high-tech blades, made of laminated materials such as composites, balsa wood, carbon fiber, and fiberglass that have high strength-to-weight ratios. The rotors are bolted on the central hub, and a pitch mechanism allows the blade to rotate on its axis to take advantage of different wind speeds. The blades are shaped like an airplane wing or airfoil. As a result, wind creates lift on the blades causing the rotor hub to spin. This rotation is transferred to a gearbox where the speed of rotation is increased to the speed required for the attached electric generator that is housed in the nacelle. The blades are non-metallic and equipped with a sophisticated lightning protection system.

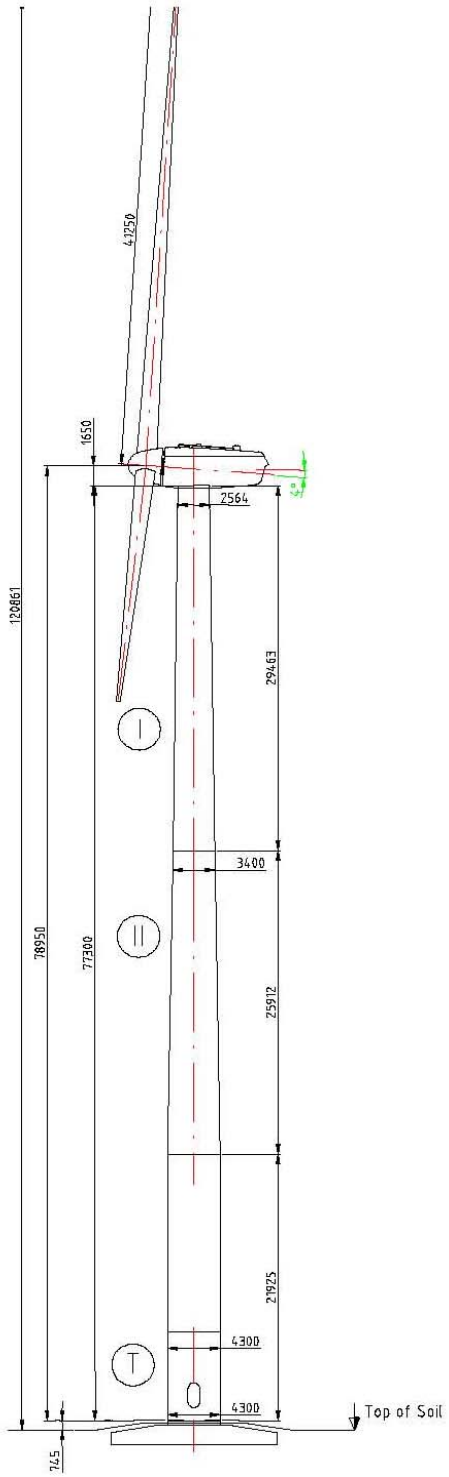

Figure 2-1 Schematic of GE 1.6xle WTG.

2.9.1.2 Nacelle

The heart of the wind turbine is its electrical generating system. The rotor drives a large shaft into a gearbox, which steps up the revolutions per minute to a speed suitable for the electrical generator. The gearbox and generator are mounted on a bedplate to increase durability and minimize noise. The shaft usually has two independent braking systems as safety mechanism. The gearbox, generator, and various pieces of control equipment are enclosed within the nacelle, which houses the unit that protects the turbine mechanics and electronics from environmental exposure.

The turbine has a yaw drive system to keep the rotor facing the wind and to unwind cables. The drive system consists of an electric or hydraulic motor, mounted on the nacelle, which drives a pinion, mounted on a vertical shaft through a reducing gearbox. The drive system also contains the brake system, which is able to stop the turbine from turning. To control the functioning of the WTG, the drive system is fitted with a number of sensors to read the speed and direction of the wind, the amount of electrical generation, the rotor speed, the blades' pitch, the turbine's vibration, the temperature of the lubricants, and other variables. A computer processes the inputs to carry out normal operation of the turbine, and a safety system can override the controller in an emergency. To condition and control the power output, the generator is equipped with a remote control and monitoring system.

2.9.1.3 Tower Structure

The nacelle and generator are mounted on top of a tubular steel tower to allow the blades to take advantage of winds aloft. Towers used for the WTGs consist of three tubular steel sections coated with paints and sealants. The towers supporting each WTG will be a tapered steel monopole, approximately 262 ft (80m) in height. The tower is supported by a reinforced-concrete foundation ranging from 48 to 80 ft in diameter, depending on final engineering design. The tower will be uniformly painted a neutral color that complies with Federal Aviation Administration (FAA) requirements for daylight marking. The towers feature a locked entry door at ground level and an internal access ladder with safety platforms for access to the nacelle. A controller cabinet will be located inside the base of each tower. Towers are pre-fabricated in three sections and delivered and assembled on site.

2.9.1.4 Transformer

A pad-mounted step-up transformer will be installed at the base of each WTG to increase the output voltage to the level of the power collection system (34.5 kV). A small concrete slab or fiberglass foundation, a concrete vault, or other suitable base will be used to support the step-up transformers.

2.9.1.5 Foundations

The tower for the WTG will be set on a poured-in-place spread-foot concrete foundation. The actual foundation design for each WTG turbine will be determined based on site-specific geotechnical information and structural loading requirements of the turbine model.

2.9.1.6 Aviation Lighting System

The WTGs will be grouped in arrays, and some of the WTGs will require FAA-mandated aviation warning lights. The number of WTGs with lights and the lighting pattern of the WTGs will be determined through consultation with the FAA prior to construction.

WWI is committed to minimizing visual impacts caused by the aviation warning lights located at the top of WTGs. Consequently, PWP I, LLC and PWP II, LLC intend to install a radar-based obstruction lighting control system that, pending FAA approval, will allow PWP I, LLC and PWP II, LLC aviation warning lights to remain off until triggered by the system when a low-flying aircraft is detected and determined to be tracking on an unsafe heading. As the aviation warning lights are only activated by this activity, this system leaves the nighttime sky free of unnecessary light pollution, thus minimizing visual impacts and associated public nuisance issues.

2.9.2 Power Collection System

A network of collection power cables will be installed along and between the turbine strings to collect power generated by the individual wind turbines, transform the power to 34.5 kV, and route it to the collector substation. Collection power cables will be buried wherever possible at a minimum of four feet below the ground surface. The collector substation, located on the PWP I site, will convert the electricity

to transmission voltage (230 kV) for delivery into the interconnection substation or switchyard and then to the electrical grid.

The Project electrical system will therefore consist of three key elements:

1. A collector system that collects energy generated at 690 volts from each WTG, transforms it to 34.5 kV through a pad-mounted transformer, and delivers the power through a network of electrical conductors.
2. A collector substation that transforms energy delivered by the collector system from 34.5 kV to 230 kV.
3. A 230 kV transmission line, which delivers the electricity and interconnects to the Rocky Mountain Power transmission line.

2.9.3 SCADA System

A supervisory control and data acquisition (SCADA) system will be installed to collect operating and performance data from each WTG and provide remote monitoring and operation of the WTGs when appropriate. The WTGs will be linked to one or more central computers via a fiber optic network installed in the electrical collector line trenches, at least four feet below the ground surface. The host computer(s) is expected to be located in the substation building control room in the PWP I project site. The SCADA software will consist of applications developed by the turbine vendor and/or a third party SCADA vendor.

2.9.4 Meteorological Towers

Two permanent meteorological (met) towers will be constructed within the boundary of the project sites for the purpose of collecting meteorological data and forecasting conditions. Preliminary locations for the permanent met towers are shown on the site plan in Appendix A. The final location of the met towers will be determined in consultation with the WTG vendor.

2.9.5 Operations and Maintenance Buildings

An O&M building will be constructed within the Projects' boundaries. The O&M building will be approximately 5,000 ft^2 and will include space for offices, bathroom and kitchen facilities, a break room,

a storage area, and a garage for vehicle, turbine, and equipment maintenance. A fenced, graveled area for parking and storage also will be provided. The O& M building will use a new groundwater well or will purchase water from an existing well to supply water for domestic use and will discharge to an on-site septic system.

2.9.6 Access Roads

Mormon Canyon Road (County Road 18) bisects the two Project areas and will provide the main access route for construction, operation, and maintenance vehicles. PWP I, LLC and PWP II, LLC intend to execute a road use agreement with Converse County, which will specify how Mormon Canyon Road will be improved, maintained, repaired and reclaimed (if necessary) before, during and after construction of the Projects.

There is a network of existing dirt roads in the project area that stem off of Mormon Canyon Road. Where possible, these roads will be used as turbine access roads, minimizing disturbance caused by new road construction. All new and existing roads used to access the proposed turbine arrays will be widened to 16 ft (where necessary), graded and graveled to facilitate access by construction vehicles. Roads used for crane access will be 16-ft wide with 8-ft wide hardened shoulders (32-ft wide total). Following construction, shoulders will be ripped, reclaimed, and re-vegetated to mitigate soil compaction caused by crane traffic.

Raw materials used for access road and crane pad preparation will include aggregate and crushed rock for road base and water for dust control and road compaction. These materials will come from licensed and permitted sources located within the project area.

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3.0 CONSTRUCTION, OPERATIONS, AND DECOMMISSIONING

This section is intended to provide information on the construction, operations and decommissioning of the proposed Pioneer Wind I, LLC and Pioneer Wind Park II, LLC Park Energy Facilities.

3.1 TIME OF COMMENCEMENT AND CONSTRUCTION TIME

3.1.1 PWP I

Contingent upon approval from the Wyoming Industrial Siting Council (ISC) and obtaining all other required permits, WWI anticipates commencing road improvements, road construction and WTG foundation construction in June (second quarter) of 2011. Construction of the electrical system and WTGs would begin in July 2011 (third quarter). Please refer to Table 3-1 for a summary of the construction schedule for this project.

3.1.2 PWP II

Contingent upon approval from the ISC and obtaining all other required permits, construction activities for PWP II would commence in July (third quarter) of 2012. Please refer to Table 3-2 for a summary of the construction schedule for this project.

3.2 CONSTRUCTION COMPLETION SCHEDULE

3.2.1 PWP I

With the maximum time period for construction expected to be seven months, erection of the WTGs for PWP I is anticipated to be completed in November 2011. This would mark the estimated 90-percent-complete point of the construction schedule based on capital costs expended through the end of that month. PWP I's construction completion, as well as its commercial operation date, is planned for December 31, 2011.

Table 3-1 Preliminary Construction Schedule for PWP I.

Task	Start	Finish
Preconstruction Activities	07/21/2010	2/21/2011
Preliminary Geotech and Reporting	07/21/2010	8/27/2010
Boundary Survey and Mapping	10/11/2010	10/22/2010
Turbine Staking	10/14/2010	10/15/2010
EPC Contractor Full Notice to Proceed	2/30/2011	2/30/2011
Industrial Siting Act Permitting		
ISA Submittal	1/31/2011	1/31/2011
ISA Hearing	4/07/2011	4/08/2011
Finding of Fact	5/23/2011	5/23/2011
Civil Construction	6/01/2011	9/01/2011
Road Construction	6/01/2011	7/01/2011
Grading of Temporary Use Areas	6/01/2011	6/10/2011
Ongoing Civil Maintenance	7/01/2011	9/01/2011
Electrical Construction	7/10/2011	10/15/2011
Collection System Construction	7/01/2011	10/15/2011
Collector Substation Construction	7/10/2011	10/01/2011
Transmission Line Construction	7/01/2011	10/15/2011
Substation Energization	10/1/2011	11/01/2011
Turbine Construction	7/10/2011	12/30/2011
Foundation Construction	6/15/2011	7/30/2011
Turbine Delivery	7/01/2011	7/31/2011
Turbine Erection	7/05/2011	8/15/2011
Commissioning	11/01/2011	12/30/2011
Ancillary Construction	7/01/2011	10/15/2011
Operations and Maintenance Building Construction	7/01/2011	10/15/2011
Met Tower Installation	8/15/2011	9/10/2011
Commercial Operation	12/30/2011	12/31/2011

Table 3-2 Preliminary Construction Schedule for PWP II.

Task	Start	Finish
Preconstruction Activities		
Preliminary Geotech and Reporting	Spring 2011	Spring 2011
Boundary Survey and Mapping	Spring 2011	Spring 2011
Turbine Staking	11/2011	11/2011
EPC Contractor Full Notice to Proceed	4/01/2012	4/01/2012
Civil Construction	7/1/2012	11/23/2012
Vegetation Clearing for PWP II	10/1/2011	11/23/2011
Road Construction	7/1/2012	8/10/2012
Ongoing Civil Maintenance	8/1/2012	9/1/2012
Electrical Construction		
Collection System Construction	7/15/2012	10/15/2012
Collector Substation Expansion Construction	9/10/2012	10/01/2012
Turbine Construction	7/10/2012	12/30/2012
Foundation Construction	7/10/2012	7/30/2012
Turbine Delivery	8/1/2012	8/19/2012
Turbine Erection	8/5/2012	9/15/2012
Commissioning	11/1/2012	12/30/2012
Ancillary Construction		
Met Tower Installation	8/15/2012	9/10/2012
Commercial Operation	12/31/2012	12/31/2012

3.2.2 PWP II

With the maximum time period for construction expected to be six months, erection of the wind turbine generators (WTGs) for PWP II is anticipated to be completed in November 2012. This would mark the estimated 90-percent-complete point of the construction schedule based on capital costs expended through the end of that month. PWP II's commercial operation date is planned for December 31, 2012.

3.3 CONSTRUCTION WORKFORCE ESTIMATE

3.3.1 Estimated Number and Job Classification

The estimated number of on-site construction workers for both Projects is presented in Figure 3-1 and Figure 3-2. Table 3-3 shows a detailed breakdown of the workforce by trade. It is

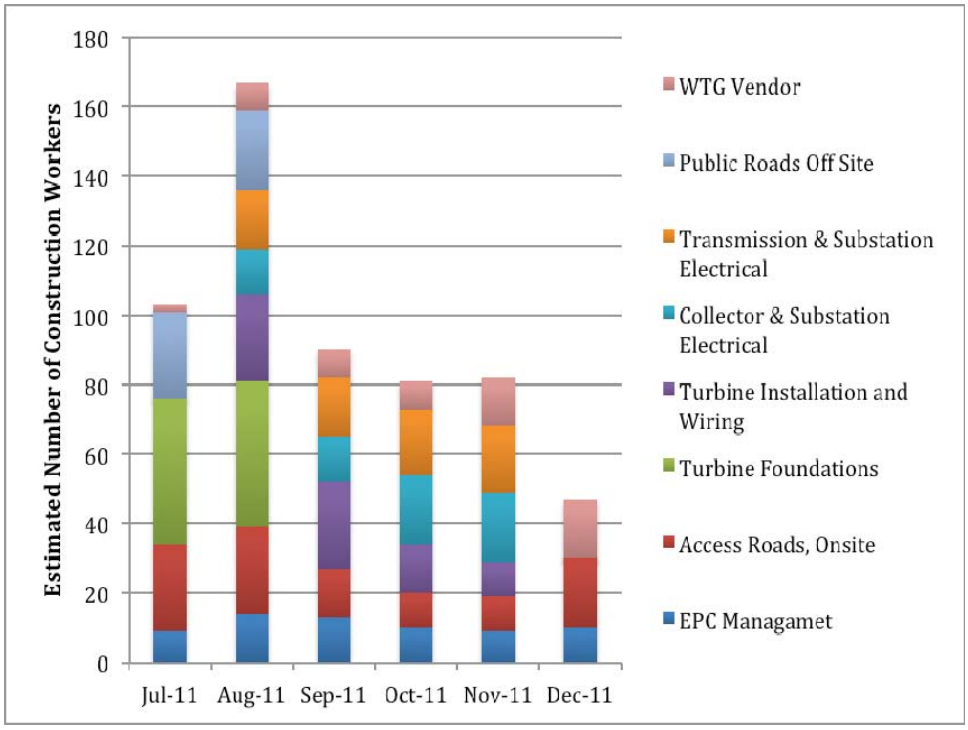

Figure 3-1 Total Number of Workers for PWP I.

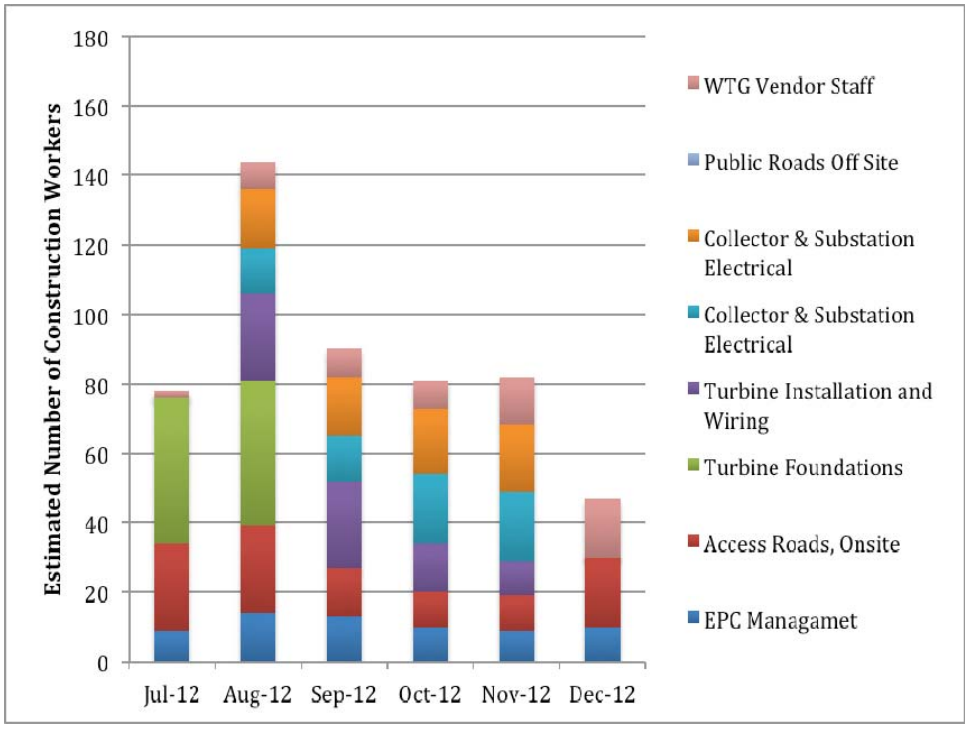

Figure 3-2 Total number of workers for PWP II.

Table 3-3 On-Site Construction Workforce Schedule.

	PWP I						PWP II					
	2nd Quarter 2011			3rd Quarter 2011			2nd Quarter 2012			3rd Quarter 2012		
Personnel	July 2011	August 2011	September 2011	October 2011	November 2011	December 2011	July 2012	August 2012	September 2012	October 2012	November 2012	December 2012
EPC Management												
Project Manager	1	1	1	1	1	1	1	1	1	1	1	1
Project Manager, Civil	1	1				1	1	1				1
Project Manager, Electrical		1	1	1	1	1		1	1	1	1	1
Project Manager, WTG Erection		1	1	1				1	1	1		
QA/QC Manager	1	1	1	1	1	1	1	1	1	1	1	1
QA/QC Inspectors, Civil	3	3	3				3	3	3			
QA/QC Inspectors Electrical		3	3	3	3	3		3	3	3	3	3
Administrative Assistant	1	1	1	1	1	1	1	1	1	1	1	1
Safety Coordinator	1	1	1	1	1	1	1	1	1	1	1	1
Security	1	1	1	1	1	1	1	1	1	1	1	1
Access Roads, On-Site												
Engineer	2	2					2	2				
Equipment Operator	10	10	8	4	4	8	10	10	8	4	4	8
Truck Driver	6	6	2	2	2	6	6	6	2	2	2	6
Foreman	1	1	1	1	1	1	1	1	1	1	1	1
Labor	4	4	2	2	2	4	4	4	2	2	2	4
Plant Operator	1	1					1	1				
Mechanic	1	1	1	1	1	1	1	1	1	1	1	1
Turbine Foundations												
Engineer	2	2					2	2				
Equipment Operator	6	6					6	6				
Laborer	12	12					12	12				

Table 3-3 (Continued)

	PWP I						PWP II					
	2nd Quarter 2011			3rd Quarter 2011			2nd Quarter 2012			3rd Quarter 2012		
Personnel	July 2011	August 2011	September 2011	October 2011	November 2011	December 2011	July 2012	August 2012	September 2012	October 2012	November 2012	December 2012
Truck Driver	8	8					8	8				
Strutural Iron/Steel Workers	6	6					6	6				
Cement Masons/Concrete Finishers	6	6					6	6				
Plant Operator	1	1					1	1				
Mechanic	1	1					1	1				
Turbine Installation and Wiring												
Foreman		1	1	1	1			1	1	1	1	
Iron Worker		4	4	2				4	4	2		
Equipment Operator		4	4	2	1			4	4	2	1	
Rigger		2	2	1				2	2	1		
Laborer		4	4	2	2			4	4	2	2	
Senior Technician		1	1	1	1			1	1	1	1	
Junior Technician		2	2	1	1			2	2	1	1	
Truck Driver		2	2	1	1			2	2	1	1	
Electrician		4	4	2	2			4	4	2	2	
Senior Electrician		1	1	1	1			1	1	1	1	
Collector & Substation Electrical												
Foreman		1	1	1	1			1	1	1	1	
Laborer		2	2	6	6			2	2	6	6	
Equipment Operator		3	3	2	2			3	3	2	2	
Truck Driver		2	2	2	2			2	2	2	2	
Rigger				1	1					1	1	
Electrician		3	3	6	6			3	3	6	6	
Senior Electrician		2	2	2	2			2	2	2	2	

Table 3-3 (Continued)

	PWP I						PWP II					
	2nd Quarter 2011			3rd Quarter 2011			2nd Quarter 2012			3rd Quarter 2012		
Personnel	July 2011	August 2011	September 2011	October 2011	November 2011	December 2011	July 2012	August 2012	September 2012	October 2012	November 2012	December 2012
Transmission and Interconnection Electrical												
Foreman		1	1	1	1			1	1	1	1	
Laborer		2	2	6	6			2	2	6	6	
Equipment Operator		3	3	2	2			3	3	2	2	
Truck Driver		2	2	2	2			2	2	2	2	
Rigger		1	1					1	1			
Electrician		3	3	6	6			3	3	6	6	
Senior Electrician		2	2	2	2			2	2	2	2	
Lineman		3	3					3	3			
Public Roads, Off-Site												
Engineer	2											
Equipment Operator	5	5										
Truck Driver	10	10										
Foreman	1	1										
Labor	6	6										
Mechanic	1	1										
WTG Vendor												
Site Manager	1	1	1	1	1	1	1	1	1	1	1	1
Site EHS Manager	0	1	1	1	1	1	0	1	1	1	1	1
Receiving TAs	1	2	2	2	0	0	1	2	2	2	0	0
Installation TAs	0	4	4	4	0	0	0	4	4	4	0	0
Commissioning TAs	0	0	0	0	12	15	0	0	0	0	12	15
Total	**104**	**168**	**91**	**82**	**83**	**48**	**79**	**145**	**91**	**82**	**83**	**48**

anticipated that during the height of construction, the on-site construction workforce (both local and non-local) for PWP I will be approximately 168. It is anticipated that during the height of construction, the on-site construction workforce (both local and non-local) for PWP II will be approximately 145.

3.3.2 Local and Non-local Workforce

PWP I, LLC and PWP II, LLC will require their EPC Contractor(s) to utilize local workers to the maximum extent possible. In order to maximize use of local labor resources, the EPC Contractor(s) will advertise in area newspapers, post local job opportunities with the Wyoming Department of Workforce Services as well as the Employment Services offices in Douglas and Casper. The EPC Contractor(s) will also contact local trade unions, search for local contractors using Internet resources, solicit local "word of mouth" referrals, talk to local businesses about local service providers, and use similar methods, as necessary, to identify and hire local employees and subcontractors.

The ratio of local and non-local workers filling job opening opportunities will vary by construction activity and the month of the anticipated construction window. Based on peak quarter monitoring results from other wind energy facilities constructed in Converse County, WWI anticipates that local hires will comprise about 60 percent of the workforce having the types of general construction skills that are available locally and 15 percent of the workforce requiring more specialized skills. Overall, it is estimated that approximately 30 percent of the total workforce would comprise local workers. Thus, there would be about 50 local workers during PWP I's peak of construction activity in August 2011 and 44 local workers during PWP II's peak of activity in August 2012.

3.4 OPERATIONS WORKFORCE EMPLOYMENT

A long-term benefit of the Projects comes from the employees who will operate and maintain the wind energy facilities. When commercial operations commence, the operation of the Projects is expected to require six full-time employees, including five Wind Technicians (trained to perform maintenance on the WTGs, SCADA, FAA lighting control system, and BOP electrical equipment) and one supervisor. There may be times when it is necessary to bring in a two-person special services team for specialized diagnostics and repair work. These individuals would only be on-site sporadically as needed and are not considered part of the regular O&M workforce.

3.5 CONSTRUCTION PROCEDURES

PWP I, LLC and PWP II, LLC will enter into contracts with a contractor(s) to undertake and complete every phase of engineering, procurement and construction for the projects. The contracts will be structured and issued as an Engineering-Procure-Construct (EPC) contract with the exception of procurement of WTGs and transformers, which will be handled by WWI.

Preliminary and final geotechnical borings were completed for PWP I WTG and electrical substation locations in October 2010. Structural engineering investigations will be completed to inform the EPC bidding process. In addition, a preliminary electrical engineering and review has been completed, as required, with respect to the interconnection of the Projects to the electrical power grid. Once the EPC contracts are awarded, the final engineering design will be performed. The final engineering design will be completed using all relevant applicable engineering standards.

The EPC contractor and subcontractors will perform a full geotechnical investigation of all turbine sites and ancillary facilities in PWP II. The EPC contractor will then prepare the construction site, complete civil site work (including access roads), install WTG pads, erect WTGs, install the underground collector and communication lines and overhead transmission line, oversee construction, and complete the final cleanup and restoration of the turbine crane pads, widened access roads, and other temporarily disturbed areas.

Construction equipment that will be utilized for the Projects include earth-moving equipment, cranes, support staff light trucks. Table 3-4 gives a list of equipment that will likely be used during construction with a general description of its use. A general overview of the construction activities associated with the Projects is given in the sections below.

3.5.1 Site Civil Work/Preparation

All access roads and WTG locations will be designed to WTG vendor specifications and will undergo final micro-siting prior to civil work. The construction area will be surveyed to the design specifications and marked clearly with stakes and flags. Erosion and sedimentation control measures, designed in collaboration with WGF and approved by WGF, will be installed. Access roads, WTG foundations, and other site locations will be cleared and grubbed, graded, and prepared for site activities. Access roads will

Table 3-4 General Construction Equipment Needed for the Project.

Equipment	Use
Bulldozers	Road and Pad Construction
Motor Graders	Road and Pad Construction
Gravel Truck Haulers/Bottom Dump	Hauling and Placement of Road Aggregate
Water Trucks	Compaction, Erosion and Dust Control
Rollers/Compactor	Road and Pad Compaction
Backhoe/Trenching Machines	Excavating Foundations, Trenches for Underground Utilities
18-Wheel Semi-Tractors	Turbine Component Delivery
Truck Mounted Drill Rigs	Drilling Soil Test Bore Holes
Concrete Trucks and Pumps	Pouring Tower and Other Structure Foundations
Conventional and Small Cranes	Off-Loading Equipment Onsite, Set Tower Components
Heavy and Intermediate Cranes	Off-Loading Equipment Erecting Towers, Nacelles, and Rotors
Cement Trucks	Hauling Tower Base Cement Material
Pickup Trucks	General Use by Construction Personnel
Small Hydraulic Cranes/Forklifts	Loading and Unloading Minor Project Equipment
All-terrain Vehicles	Site Access
Rough Terrain Forklift	Lifting Equipment
Concrete Batch Plant	Onsite Concrete Mixing for Turbine Foundations

be constructed in advance of other construction activities. Grading will be minimized and all topsoil will be stockpiled for redistribution on temporary use areas following construction.

The tower sections, rotor blades, and other WTG components are intended to be delivered directly to the PWP I and PWP II WTG locations using existing access roads whenever possible and new, temporary roads where necessary.

3.5.2 Access Roads and Crane Pad Preparation

Access roads have been located so as to minimize disturbances, avoid sensitive resources and unsuitable topography, and maximize transportation efficiency. There is a network of existing dirt roads in the project area that stem off of Mormon Canyon Road. Where possible, these roads will be used as turbine access roads, minimizing requirements for new road construction. All new and existing roads used to access the proposed turbine arrays will be widened to 16 feet (where necessary), graded and graveled to

facilitate access by construction vehicles. Of these, roads used for crane access will be 16 feet wide with 8 foot wide hardened shoulders (32 feet wide total). Where necessary, wider cattle guards or gates will be installed by the EPC contractor(s) to accommodate wider road widths.

In areas where existing roads do not provide access to wind turbine locations, and along the length of the turbine strings, new gravel roads will be constructed. Both existing and new access roads will be designed under the direction of a licensed engineer and compacted to meet equipment loading and hauling requirements. The tower sections, rotor blades, and other WTG components will be delivered directly to the WTG locations using completed access roads.

Following construction, hardened shoulders will be ripped, reclaimed, and re-vegetated to mitigate soil compaction caused by crane movement. Access roads to be used by O&M vehicles will remain 16 feet wide and be maintained throughout the life of the project. Any pre-existing roads not used for O&M purposes will be returned to their pre-construction widths. New access roads only needed for construction will be reclaimed and returned to pre-construction conditions. An exception to this would be if a private landowner or Converse County requests the road be left in place.

Crane pads are needed to provide adequate workspace to maneuver a commercial crane to install the staged tower sections, nacelle, blades, and other turbine components. Crane pads will be needed at each WTG location. The typical construction disturbance area will be approximately three acres at each turbine location. Following construction, the majority of the crane pad will be reclaimed and revegetated. The permanent footprint is expected to be approximately one acre per turbine.

3.5.3 Laydown Areas and Batch Plant

During construction, laydown areas will be used to stage construction components and store construction materials and equipment. An approximate four-acre laydown area will be located within each of the Project sites. Additionally, a three-acre area will be used for the concrete batch plant. The batch plant will be located near the O&M building in PWP I but will remain in place and be used through construction of PWP II. Aggregate for the concrete is expected to come from a permitted, on-site source. The laydown areas and batch plant area will be cleared, grubbed, and the topsoil and subsoil will be stripped and stockpiled for use during post-construction reclamation. Erosion-control measures will be implemented for the construction period and, as necessary, for permanent operations.

3.5.4 Tower Foundations

Each WTG will be supported by a reinforced concrete foundation. After access roads and crane pads are constructed, crews will begin installation of the foundations immediately adjacent to the crane pads. The actual foundation design for each turbine will be determined by a licensed engineer based on site-specific geotechnical information, structural loading requirements, final engineering design, specifications of the selected turbine model, and vendor approval. However, based on geotechnical investigation and structural engineering to date, foundations are expected to be a spread-foot type with a bottom diameter of approximately 50 feet and a depth of approximately eight feet from the top of the pedestal to the bottom of the foundation. The pedestal will be up to 20 feet in diameter and will be approximately 3.5 feet in depth. The bottom of the pedestal will be three feet below the grade and extend 0.5 feet above the grade. Depending on the final design, each foundation will require approximately 300 - 400 cubic yards of concrete, including the pedestal. During construction, a licensed engineer will prepare a special inspection report for each foundation excavation and pour.

The foundation locations will be excavated, a mud mat poured and cured, forms set, rebar installed, and concrete poured and cured to create the foundation. Given the prevalence of bedrock in both project sites, blasting may be required for excavating some of the WTG foundations. If required, blasting will be performed by state-licensed explosives experts only in accordance with a Blasting Plan. Construction dewatering is also not anticipated due to groundwater depths in the project areas; however, if is necessary to dewater foundation excavations, WWI will obtain Temporary Discharge Permits from the WDEQ.

The majority of each WTG foundation is underground, and the majority of the foundation will be backfilled with subsoil and topsoil. A 12-foot wide gravel apron will surround the towers on all sides. The turbine pad and transformer will be located within the gravel apron. The diameter of the tower base, pad, and surrounding gravel apron combined will be approximately 40 feet.

3.5.4.1 Tower Assembly

The WTG towers, nacelles, and blades will be delivered to each WTG pad location. WTG towers will comprise a 262 foot (80m) tapered monopole. Towers are prefabricated and delivered in three sections. Cranes will be brought on site to lift the multiple tower sections, nacelle, rotor hub and blades from trucks and place them near the tower foundation. Once all of the turbine foundations are completed and the

turbine components have been brought to the site, the first step will be to lift and secure the down-tower electrical assembly and secure it to the foundation. The base section of the tower will be installed over this equipment. The mid tower section will be connected to the base tower section, and the top tower section will be connected to the mid tower section. Once the nacelle is placed on the top of the newly constructed tower, the three blades will be bolted to the rotor hub, lifted by a construction crane, and connected to the main shaft of the turbine nacelle.

3.5.5 Power Collection System

Power generated by the individual turbines will be transformed to 34.5 kilovolts (kV) via the pad-mounted transformer located adjacent to each turbine, and collected through a buried cable network located along and between the turbine arrays. The electricity will be then be routed to the collector substation located within the PWP I project site (Appendix A, Map A-2). The transformer located within the collector substation will convert the electricity to transmission voltage (230 kV) for delivery to a newly-built interconnection substation located on privately leased land in the northernmost portion of the project site. This facility will be designed and constructed according to utility design requirements, and at this point, power generated by the projects will enter the electrical grid.

3.5.5.1 Collector Systems

The collector system will be underground unless site-specific considerations require a portion of it to be aboveground. For example, it is anticipated that the collector system connecting PWP II to the project substation in PWP I will be bored under Willow Creek. If, for some reason, boring this line beneath the creek is not feasible or environmental impacts could be reduced by having the cables cross Willow Creek via overhead lines, the system may be located above ground in this area.

The collector cable and surrounding insulation jacket is expected to be less than three inches in diameter. The power cable between WTGs in a turbine string will be stranded metal. The cables connecting each string in PWP I to the collector substation and connecting PWP II to the substation will use a larger gauge stranded metal conductor.

The underground electrical and communication cables will be installed adjacent to access roads where possible. Trenching for this purpose involves excavating a three-foot to five-foot-wide and four-foot-

deep (minimum) trench. Topsoil will be segregated from subsurface soil into separate stockpiles. After the cables are buried, the trenches are backfilled with the remainder of the subsurface soil pile, covered with topsoil, graded and restored to the original contours, and reseeded with a reclamation seed mixture.

Trenching typically involves specialized equipment, which effectively excavates the soil at the front and simultaneously lays the cable(s) at the back, disturbing only a several-inch-wide strip of surface soil. Selection of the installation method is dependent on site-specific factors such as soil type, contractor and equipment availability and manufacturer's installation specifications.

A generator step-up (GSU) transformer will be installed immediately adjacent to the base of each wind turbine, to increase the output voltage of the turbine to the voltage of the power collection system (34.5 kV). The transformer will be encased in a four-foot by four-foot by four-foot steel box, and will utilize non-polychlorinated biphenyl mineral oil as coolant. Support for the transformers is expected to be a fiberglass vault, excavated below grade, and will serve as a containment system in the event of malfunction and any associated mineral oil leakage.

3.5.5.2 Collector Substation

Electrical output from the Projects will be delivered to a 34.5 kV/230 kV collector substation located in the northern portion of the project area (please refer to Map A-2 for the anticipated location of this substation).

The collector substation facilities will occupy approximately two acres within a larger cleared area of approximately six acres, two acres of which will be reclaimed and revegetated following construction. The substation site will be cleared, graded, and graveled, with erosion and sedimentation (E&S) measures installed as required. Transformer pads, oil spill containment structures, and their foundations will be excavated, forms and grounding grid set, rebar installed, and the concrete poured and cured to create the foundation. Backfilled soil will be graded and compacted, and any excess soil will be distributed about the site. The two-acre substation site will be surrounded by an additional two acres of gravel and enclosed within a chain-link fence to secure access only for authorized personnel. The transformers will be oil-cooled and insulated. The substation equipment will include circuit breakers, power transformer(s), bus and insulators, disconnect switches, relaying equipment, battery and charger, surge arrestors, alternating current and direct current (AC/DC) supplies, a single-room control building, metering

equipment, Supervisory Control and Data Acquisition (SCADA) system, grounding and associated control wiring.

Electrical components and associated equipment will be transported to the site and installed with appropriate construction equipment. The collector substation facilities will conform to all applicable state and national codes and standards and will be inspected and approved during substation commissioning.

3.5.5.3 230 kV Transmission Lines

The WTGs for the Projects are grouped into strings or arrays and interconnected with an underground power collection system, which transfers generated electricity to the collector substation. The collector substation will be connected to the local transmission grid via a proposed 230 kV transmission line. The planned route for this overhead transmission line extends northward approximately five miles from the collector substation (located in PWP I), crossing leased private land within the project area to the transmission interconnection substation (please refer to Map A-2 for an illustration of the proposed alignment). PWP I, LLC will own and operate the 230 kV transmission interconnection line.

3.5.5.4 Interconnection Substation/Switchyard

The Projects' transmission line will terminate at the interconnection substation, or switchyard, located on the northern boundary of the project area where it is traversed by PacifiCorp's existing Dave Johnston - Difficulty 230 kV transmission line. PWP I, LLC and PWP II, LLC will construct this switchyard in conformance with PacifiCorp's specifications, which have been identified in a Facilities Study completed as part of the draft Large-Generator Interconnection Agreement (LGIA) between PacifiCorp and PWP I and PWP II. WWI anticipates that the final LGIAs for the Projects will be executed by Fall, 2011.

Construction methods and equipment are similar to those described for the collector substation described above. Major equipment at the switchyard includes a 28 foot by 40 foot control building, circuit breakers, vertical structures, surge arresters, metering units, and other equipment designed to accept power generated by the Projects while ensuring the safety and reliability of the electrical grid. The interconnection substation will also be linked to the collector substation via a fiber optic communications line, which will be used to operate line protection systems and to communicate status and loading information back to PacifiCorp's energy control center. The switchyard will also contain a microwave

communication system with a tower sufficient for communications to the Glenrock communications site. Although funded and constructed by PWP I, LLC and PWP II, LLC, the switchyard will become PacifiCorp property.

3.5.5.5 Communication Cables

Fiber optic communication cables will be connected to each of the WTGs and located underground alongside the electrical collector system lines. Communication cables will allow individual WTGs to supply data to and be controlled by the SCADA system (see Section 3.6.7 below) in real time.

3.5.6 Meteorological Towers

Two 262-foot (80 m) permanent meteorological (met) towers are proposed to be placed within the project area, one on the PWP I project site and one on the PWP II project site. Preliminary locations for these met towers are shown on Map A-2. Permanent met towers are to be lattice structures with concrete foundations and no guy wires. The towers are to be lighted per Federal Aviation Administration (FAA) guidance and the final locations determined in consultation with GE at the beginning of the construction period for each Project.

3.5.7 SCADA

An industry-standard Supervisory Control and Data Acquisition (SCADA) system will be installed to collect operating and performance data from each WTG and each wind park as a whole. The SCADA also provides for remote operation of the WTGs. The WTGs are connected to the SCADA system via a fiber optic network. Fiber optic cables will be placed alongside the power collector cables, and installed four feet below grade. The SCADA host computer is located on site in the O&M building. Software for the SCADA system will consist of applications developed by the turbine vendor or a third-party SCADA vendor.

3.5.8 Turbine Commissioning and Testing

After all WTGs are erected and the electrical collection systems are interconnected, all associated systems, controls, and safety equipment will be calibrated and tested. Qualified technicians, as well and

turbine vendor commissioning experts and electricians, will test and inspect all WTG components, transformers, communications systems, substation and switchyard, and transmission systems to ensure they comply with required design specifications and are working properly and safely. Every WTG and all associated equipment will be inspected and tested upon individual completion before being placed into service.

3.6 OPERATION AND MAINTENANCE ACTIVITIES

Operations and maintenance (O&M) staff will manage the Projects once commercial operations have begun. Maintenance time for a typical modern WTG is approximately 40 hours per year, which includes standard, semi-annual maintenance as well as monthly padmount transformer inspection. Non-routine maintenance can be of a similar magnitude to routine maintenance. PWP I, LLC and PWP II LLC's Turbine Supply Agreements includes a two-year full warranty package beginning at the conclusion of construction that ensures that all turbine equipment is new and free from defects in material, workmanship and title. Any turbine repair during this two-year period is then warranted for a period of twelve months from the date of repair or until the end of the original warranty period, whichever is later.

3.6.1 Proposed On-Line Life and Projected Operating Capacity

The electrical generation capacity of PWP I and PWP II is 49.6 MW each. The economic lives of the Projects are projected to be at least 20 years. The operational life may be extended depending on the overall condition of the infrastructure and the market conditions. The 230 kV transmission line is being constructed to serve the electrical output of the two 31-WTG turbine projects, and the economic life of the transmission line is projected to be 50 or more years. The transmission line design is anticipated to allow for future repowering of the Projects.

3.6.2 Facility Operation and Maintenance

Although the Projects will generate electricity, PWP I and PWP II require a separate power supply for the small amount of electricity used by the O&M building, WTG control systems, the SCADA system and the FAA lighting system. WWI will work with Rocky Mountain Power to extend a distribution line to the O&M building. Power will be supplied to the WTGs via underground conduits. Permanent PWP I, LLC and PWP II, LLC employees or contract employees will operate and maintain the project facilities from the O&M building. The annual energy requirements of the facilities are expected to range from

approximately 248,000 – 341,000 kWh per year for each of the two Projects. During the winter, Mormon Canyon Road will be kept plowed as far as the O&M facility. WTG access roads will be plowed on an as-needed basis for turbine maintenance and repairs.

3.6.2.1 Wind Turbine Generators

To maximize performance and detect potential malfunctions, routine maintenance will need to be performed on the WTGs. O&M procedures will be established prior to each of the Projects' commercial operation date and will define specific routine maintenance and inspection activities in accordance with the WTG manufacturer's recommendations. Scheduled routine maintenance will be conducted on each WTG every six months. Routine maintenance performed by O&M personnel will include periodically replacing lubricating fluids, checking parts for wear and recording operating parameters. Other inspection and maintenance operations will be performed on roads, pads, and trenched areas to ensure that erosion control measures are functioning properly. Repairs to the Projects' facilities will be conducted by the O&M staff, with the assistance of contracted personnel as needed.

Each WTG will be continually monitored by the SCADA system, which reports all major aspects of operation through fiber optic communication lines linking the WTGs to the O&M building and, potentially, a remote operations center. Alarm systems will be designed to trigger in the event operational characteristics fall outside predefined limits. Each WTG has an automatic system to shut down the rotor in the event of malfunction or excessive wind speeds. Any problems that arise are immediately reported to onsite O&M personnel for correction.

3.6.2.2 Transformers and Substations

Step-up transformers, substations, and pad-mounted transformers will be maintained as part of the normal O&M activities in accordance with North American Electric Reliability Corporation (NERC) standards. In general, transformers located at the base of each WTG are inspected visually and via infrared scans every six months. The oil in WTG transformers is sampled once per year. Substation transformers receive visual inspections and infrared scans at least once per year (but may be inspected weekly or monthly as part of O&M staff duties) and oil sampling once every five years. Based on sample results, transformers may require complete filtering. Filtering typically occurs every ten years.

Substation safety equipment is inspected every three to six months; batteries, chargers, and building HVAC equipment are checked every 6 months; disconnect switches have their operation and alignment inspected annually. The operation of interrupting equipment (e.g., breakers, re-closers) is inspected annually and their timing and calibration is assessed every five years. Protective relays are generally tested and calibrated every five years unless more frequent assessments are required by the interconnecting utility. In the event that a transformer or other device fails, replacement of the equipment will be accomplished as quickly as possible.

3.6.2.3 Underground Collection Line

Underground collection lines are relatively maintenance-free, but will be maintained as needed. Depending on the method of installation, maintenance of the buried collector lines is typically limited to an approximate five-foot to ten-foot wide linear corridor, with protective material placed both above and below the electrical and fiber optic lines. Upon back-filling, the surface is reclaimed and revegetated. All electrical terminations are to be located above ground in appropriate weather-tight, secure electrical enclosures to facilitate ease of maintenance.

3.7 SITE DECOMMISSIONING AND RECLAMATION

This subsection provides information on the methodology and financial cost statement of decommissioning and reclaiming the Projects. A decommissioning and reclamation plan accompanied by financial assurance that the plan can be implemented when needed is required by the ISA, Converse County, and the terms of PWP I, LLC and PWPW II, LLC's lease agreements with private landowners.

3.7.1 Site Decommissioning

Decommissioning is a step-by-step, methodical deconstruction process, which involves removing and disposing of the Projects' WTGs and associated facilities and infrastructure. With some exceptions, site decommissioning involves the reverse of site construction. In general, wind energy projects that are decommissioned have a high scrap value due to the ability to reuse and recycle many of the materials and equipment contained in the infrastructure (e.g., steel, copper, electrical generators, etc.).

Decommissioning of PWP I and PWP II is expected to follow a standard procedure, which typically includes the following:

- All WTGs will be dismantled and either relocated to other wind energy projects or sold for scrap value;
- Electronic equipment will be recycled whenever possible. If not, it will be disposed of in landfills or properly licensed hazardous waste facilities as appropriate (some electronics are considered hazardous waste due to the presence of heavy metals);
- Transformers and electrical control devices will be reused in other applications or sold as scrap after fluid removal;
- Turbine foundations will be removed down to a depth of four feet and backfilled with stockpiled subsoil and topsoil;
- Underground collector cables below four feet in depth may be left in place;
- The access roads, rock or gravel in the electrical substations, transformer pads, and building foundations will be removed and recycled if no longer needed or wanted by the landowners;
- Land areas covered in rock, gravel, or building/tower footprints will be restored to a natural grade (which includes ameliorating soil compaction that might have resulted from project uses) and reseeded or replanted with native vegetation or pasture grasses following consultation with current landowners;
- Electrical substations and storage building will be dismantled, including inspection for and remediation of any environmental contamination;
- Demolition or removal of equipment facilities will meet applicable environmental and health regulations, and economically recoverable materials will be salvaged;
- All disturbed areas will be reclaimed and restored so prior land uses can be resumed.

WWI has estimated the decommissioning cost based on information provided by an EPC consultant. The cost to decommission and reclaim PWP I (which includes the transmission line and substations) is estimated at $10,003,400. Decommissioning costs for PWP II are estimated to total $8,764,400. It is important to note that these estimates reflect gross decommissioning and reclamation costs. It is expected that the market value of the scrapped materials will offset these costs substantially, resulting in a significantly lower net cost to decommission the two facilities.

A detailed decommissioning and reclamation plan will be completed for the Projects and submitted to the ISD for review and approval prior to initiating construction on PWP I. This plan will contain decommissioning and reclamation cost estimates made by an independent certified professional engineer retained by WWI and subject to review and approval by the DEQ. The decommissioning and site reclamation plan and associated cost estimates shall be updated and submitted to the ISD every five years after the date of permit issuance until the completion of final reclamation. Facility decommissioning and reclamation will begin within 12 months after the facility ceases to produce electricity.

PWP I, LLC and PWP II, LLC will obtain security to serve as collateral to guarantee appropriate decommissioning. This will be in the form of a surety bond, certificate of deposit, corporate guarantee or other form acceptable to the DEQ and ISC. The value of the security will reflect the gross decommissioning and reclamation costs contained in the decommissioning and reclamation plan. WWI expects this plan to be available for ISD review following the execution of EPC contracts in 2011.

3.7.2 Reclamation

Following construction, temporary use areas (parking and laydown areas, the concrete batch plant, access road shoulders, cable trenches, etc.) will be reclaimed and revegetated with landowner-approved, habitat-appropriate seed mixes.

After the life of the Projects, aboveground facilities will be removed and the disturbed areas reclaimed and returned to pre-Project land uses. As is required by leases with the private landowners, reclamation will typically include amending compacted soils, regrading to natural or near-natural topographic contours (where appropriate), replacing salvaged subsoil and topsoil, reseeding disturbed areas with habitat-appropriate seed mixes (or seed mixes desired by the current landowners), and controlling noxious weeds.

Appendix C contains proposed seed mixes suitable for use in reclaiming temporary use areas following construction of PWP I and PWP II as well as in permanent reclamation following decommissioning of the two Projects. Species proposed for seeding are based on existing habitat types, commercial availability, and current land uses. Minor species substitutions can and should be made to these lists based on site-specific characteristics such as soil texture, slope aspect, moisture availability, and specific land uses.

Species substitutions can be further tailored depending on long-term and current land use objectives by the surface owner and on the desired habitats following project decommissioning and reclamation.

3.8 LIST OF PERMITS REQUIRED FOR CONSTRUCTION

All permits required for construction of the Projects will be obtained prior to the initiation of construction in summer 2011. Anticipated required permits are listed in Table 3-5.

Table 3-5 Potential Federal, State, and Local Permit Requirements.

Jurisdiction	Permit/Decision	Status/Agent
Federal		
Federal Aviation Administration	Notice of Proposed Construction or Alteration	Submitted/WWI filed in November 2010
U.S. Army Corps of Engineers	Clean Water Act (CWA) Section 404 - Individual or Nationwide Permit	Need for permit pending final design and wetlands reconnaissance survey; current site plan avoids new impacts to wetlands and improves existing stream crossings/PWP will apply for permit, if needed.
U.S. Environmental Protection Agency (EPA)	Spill Prevention Control and Countermeasures (SPCC) Plan - Construction	Pending final design/EPC will file before construction begins
	SPCC Plan -Operation	Pending final design/EPC will file before construction begins
Federal Communications Commission	Private Operational Fixed Microwave License	Pending final interconnect substation design/WWI will file application prior to construction
State		
Wyoming State of Engineer's Office	Permits to appropriate groundwater (use, storage, dewatering) or water stored in impoundments or reservoirs, Wyoming statutes (W.S.) 41-3-901 through 41-3-398, as amended (Form U.W. 5)	Pending final design/WWI will file before construction begins
Wyoming Department of Environmental Quality	Wyoming Industrial Development and Siting Act / Industrial Siting Council Order	Submitted/WWI
	Wyoming Pollutant Discharge Elimination System (WyPDES) – Large Construction General Permit (WYR10-0000)	Pending final design/EPC will file before construction begins

Table 3-5 (Continued)

Jurisdiction	Permit/Decision	Status/Agent
Wyoming Department of Environmental Quality (continued)	General Permit for Temporary Discharge	Pending final design/EPC will file before construction begins
	Permit to Construct Small Wastewater Facilities (Septic Tanks and Leach fields)	Pending final design, depending on size of septic tank needed for O&M Building/EPC will file prior to construction
	Section 401 Water Quality Certification	Pending final design/WWI will file in conjunction with 404 permit, if needed
	Air Quality Division - Temporary / Portable Source Air Permit	Pending final design/EPC or subcontractor will file before construction begins
	Water Quality Division - Temporary Increase in Turbidity Permit	Pending final design; permit review in conjunction with CWA 404 permit and 401 certification processes/WWI will file prior to construction, if and as necessary
	General Permit for Wetland Mitigation	Pending final design/WWI will file if and as needed before construction begins
Wyoming Department of Transportation	Right-of-Way Encroachment for collector line crossing of Mormon Canyon Road	Pending final design/WWI will file prior to construction.
	Port of Entry Permit for Oversized/Overweight Loads	Pending final design/Prior to construction when turbine delivery schedule is finalized.
	Road Use Agreement	Pending final design/Prior to construction when turbine delivery schedule is finalized.
Wyoming Office of State Lands and Investments	Wind Energy Lease	Application pending/WWI will go before State Board of Land Commissioners in 2011
Local		
Converse County	Road Use Agreement	Negotiations pending/PWPI, LLC and PWP II, LLC will execute prior to construction
	Wind Energy Conversion System (WECS) Use Permit	Application in progress/WWI intends to submit in February 2011

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4.0 PUBLIC INVOLVEMENT

4.1 AREA OF SITE INFLUENCE AND AREA PRIMARILY AFFECTED

WWI recommends that the area of site influence for the proposed Projects include Converse County and the communities of Glenrock, Douglas and Rolling Hills as well as Natrona County and the communities of Casper, Evansville, Mills and Bar Nunn. For the purposes of public involvement and the socioeconomic assessment, the local governments and joint powers boards located within these areas are assumed to be those primarily affected by construction and operation of the proposed Projects. Refer to Section 5.1 for a more thorough description of the Area of Site Influence, Area Primarily Affected, and Study Area relevant to the socioeconomic baseline and effects analysis for the proposed Projects.

The following sections describe WWI's efforts to coordinate with local governments, state and local agencies, and the community at large. This chapter also provides a summary of frequently asked questions and WWI responses to community concerns.

4.2 COMMUNICATION WITH LOCAL GOVERNING BODIES

WWI conducted a communications and outreach campaign with local governments recommended as primarily affected by the proposed Projects as defined in the Rules and Regulations of the Industrial Siting Council.

Beginning in September of 2010, WWI began contacting by phone, email and in person, the local governments in the recommended Area of Site Influence to schedule a time to meet in person to present and discuss the proposed Projects. Many of the governing bodies were interested in meeting with representatives of the Projects. WWI representatives met in person with: the Board of Converse County Commissioners; the Board of Natrona County Commissioners; Town of Glenrock; City of Douglas; City of Casper; Converse County School District #2; Town of Bar Nunn; Town of Mills; Town of Evansville; Town of Rolling Hills; Converse County Tourism Joint Powers Board; and, Converse County Municipal and County Joint Powers Board.

Format of Local Government Meetings: Most of the in-person local government meetings within the Recommended Area of Site Influence were public meetings in which a WWI representative(s) spoke

during a scheduled part of the regular meeting agenda. WWI presentations began with an introduction of Wasatch Wind, parent company of WWI, as the developer of the PWP I and II, and an overview of PWP I and II. A map illustrating the location of the two projects was provided to help orient participants to the sites. Following a brief presentation, we responded to questions from the local governing body and, in the case of the first Town of Glenrock presentation, from the audience as well.

Several of the local government governing bodies declined or did not respond to WWI's meeting offer. For these entities, we either discussed PWP I and II over the phone and followed up with an email and fact sheet about the Projects (Appendix D, Exhibit 1) or met with one or two representatives of the local government. For local governments (primarily joint powers boards) that we were unable to reach by telephone, WWI contacted the appropriate parties via email with our fact sheet and an introduction to PWP I and II and to Wasatch Wind.

In addition to the phone, email and in-person meetings between WWI and governing bodies, WWI provided official written notification of the proposed facility to all governing bodies of all recommended primarily affected local governments per W.S. §35-12-109 (a) (xix). Our efforts pertaining to this notification process are described in Section 4.2.1 below.

Outreach and meetings with governing bodies and staff of local governments within the recommended Area of Site Influence are described in Table 4-1.

4.2.1 Notices to Governing Bodies of Recommended Primarily Affected Local Governments

A letter notification, including information about the Projects and maps, was sent to the governing bodies of all local governments within the Projects' recommended Area of Site Influence via certified mail. This notification was mailed on October 6, 2010, approximately 60 days prior to the then-anticipated submittal of the Application, and WWI requested that questions or concerns be identified by November 5, 2010 in order for those issues to be addressed in the Application. A copy of one of these letters, which serves as an example, is included as Exhibit 2 in Appendix D. A copy of the mailing list is attached as Exhibit 3.

Table 4-1 Local Government Coordination.

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
Converse County Board of Commissioners	16-Feb-10	In Person	Michelle Stevens, John Aubrecht, RMT Engineering	The purpose of the meeting was to discuss road access options into the project area in order to gather any input the County would have with us making improvements to their roads.	Yes
Converse County Board of Commissioners	20-Jul-10	In Person	Michelle Stevens, Christine Mikell	The purpose of the meeting was to discuss roads, county permit processes, and the PPA signing.	Yes
Douglas Interim City Manager/City Planner - Forrest H. Neuerburg	28-Jul-10	In Person	Michelle Stevens	The purpose of the meeting was to introduce the project and provide Mr. Neuerburg with a map of project location. WWI spoke about impacts to Douglas from past projects. We provided general info about the project, answered questions, and spoke about the process.	Yes
Douglas Interim City Manager/City Planner - Forrest H. Neuerburg	08-Aug-10	In Person	George Blankenship	The purpose of the meeting was to discuss previous experience with Glenrock-area wind energy construction projects and identify infrastructure capacities.	Yes
Glenrock Town Council	23-Aug-10	In Person	Michelle Stevens, George Blankenship	The purpose of the meeting was to introduce WWI and PWP I and PWP II to the Council. The Council was interested in the following issues: Local labor; revenue that will come into the town through the use of lodging, restaurants, grocery and services; and roads.	Yes
Natrona County Commissioners	24-Aug-10	In Person	Michelle Stevens, George Blankenship	The purpose of the meeting was to introduce the project to the Natrona Commissioners. They had questions about roads, federal subsidies, bonding, and lighting among others.	Yes
Casper Community Development Director	24-Aug-10	In Person	Michelle Stevens, George Blankenship	The purpose of the meeting was to provide an overview of PWP I and PWP II and discuss previous experience with Glenrock-area wind energy construction projects.	No
Casper City Attorney and Manager	8-Sep-10	In Person	Christine Mikell, George Blankenship	The purpose of the meeting was to provide an overview of PWP I and PWP II, discuss previous experience with Glenrock-area wind energy construction projects and discuss concerns about long term jobs, tax revenues, and visual impact.	Yes

Table 4-1 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
Mills Town Council	8-Sep-10	In Person	Christine Mikell, George Blankenship	The purpose of the meeting was to introduce WWI and the Projects to the council. The Council and Police Chief said that they had not experienced impacts from previous Glenrock-area wind energy projects. The council appreciated the visit but said there was no need to meet them again.	Yes
Converse County School District #2 – Board and Superintendent	9-Sep-10	In Person	Christine Mikell George Blankenship	The purpose of the meeting was to introduce WWI and the Projects to the school board. They all felt property rights were paramount. All want to see Mormon Canyon road improved for school children's' ease of getting to school.	Yes
Mayor of Lost Springs - Leda Price	9-Sep-10	Phone	Christine Mikell	The purpose of the meeting was to introduce WWI and the Projects to the Mayor and Town of Lost Springs.	Yes
Bar Nunn Town Council	21-Sep-10	In Person	Michelle Stevens	The purpose of the meeting was to introduce WWI and the Projects. The council had three main questions: Will you be building a new transmission line? Will you use eminent domain? How much is a wind lease worth to a landowner?	Yes
Rolling Hills Town Council	21-Sep-10	In Person	Christine Mikell George Blankenship	The purpose of the meeting was to introduce the Projects and discuss potential turbine routes. They were concerned about the turbines' color and view shed issues. What is the project size? What about property values? Restitution fund for things such as windshield cracks from gravel trucks? If we can make them feel like a partner, that we are part of the community, it will go a long way.	Yes
Converse County Tourism Promotion Joint Powers Board	21-Sep-10	In Person	Michelle Stevens, Christine Mikell, George Blankenship	The purpose of the meeting was to introduce WWI and the Projects. Much of the discussion focused on how to encourage our construction workforce to stay in Douglas to bring lodging revenue into Converse County. The board discussed ways to use wind energy to attract interested visitors/tourism to the area.	Yes

Table 4-1 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
Douglas City Council	27-Sep-10	In Person	Michelle Stevens	The purpose of the meeting was to introduce WWI and the Projects. Their primary interest in the projects is ensuring as many workers stay in their town as possible. They asked how much space the wind turbines would take up.	Yes
Evansville Town Council	27-Sep-10	In Person	Sam Lichenstein	The purpose of the meeting was to introduce WWI and the Projects. We discussed the number of temporary workers that may stay in the Casper Area. They asked if the turbines would be shipped via railway and if the project would be using Highway25 or Yellowstone to deliver the turbines.	Yes
Glenrock Town Council	27-Sep-10	In Person	Christine Mikell	As per Glenrock's request for ongoing communication, the purpose of the meeting was to provide an update on meetings with municipalities and school districts. WWI is still on track for application submission before the end of the year. Discussed visual simulations. Alerted them about the open house possibly Nov 9th. Answered a few of their questions about federal subsidies.	Yes
Kim Rightmer, VP Casper Area Economic Development Association (CAEDA), administrator for Casper Area Economic JPB	28-Sep-10	In Person	Michelle Stevens	The purpose of the meeting was to introduce WWI to the administrator for the Casper Area Economic JPB. We discussed the Projects, wind as a way to generate economic development in the area, worker lodging, and transportation issues. Ms. Rightmer was going to follow-up with the JPB to find out whether they'd like to meet with WWI as a group.	Yes
Central WY Regional Water JPB - Paul Bertoglio	1-Oct-10	Phone	Christine Mikell	The purpose of the meeting was to discuss potential impacts by the construction and operation of the PWP I and PWP II. The main concern is the grid and how the wind turbines affect the stability. He is concerned that the pumps might fail if the system is overloaded. He is apprehensive about anything that affects the reliability or the cost of power.	Yes

Table 4-1 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
Casper Area Economic JPB	4-Oct-10	Email	Michelle Stevens	Following the meeting with Kim Rightmer, administrator for the Casper Area Economic JPB, WWI followed-up by email with each of the JPB members. WWI provided a fact sheet about the Projects and offered to meet with the JPB in person. WWI received no response.	Yes
Converse County Commissioners	6-Oct-10	In Person	Christine Mikell	The purpose of the meeting was to discuss access routes to the projects as well as impacts to landowners from possible road changes. We also discussed road access agreements and snow removal from roads.	Yes
Natrona County School District, Superintendent Joel Dvorak, Assistant Michelle Wallace Frank, Facilities staff Dennis Bay and Mark Anrim	6-Oct-10	Email	Michelle Stevens	WWI sent info via email to the Superintendent Joel Dvorak and his assistant Michelle Wallace Frank. Ms. Frank replied that she had forwarded email and info to Dennis Bay and Mark Anrim. Ms. Frank stated: "We look forward to the positive impact that the projects can bring to Natrona and Converse County." WWI replied to Mr. Bay and sent him a fact sheet and FAQ and told him we'd include him on updates going forward.	Yes
Converse County Municipal and County JPB	6-Oct-10	In Person	Christine Mikell	The purpose of the meeting was to give a PWP I and PWP II overview and answer questions about the projects: Who is WWI? What have you developed and owned? Restitution for those that are visually impacted by project? How will WWI handle taxes? Who will pay for the road damage? When are you going before state lands? When will you be showing the visual simulations?	Yes
Natrona County Tourism JPB - Aaron McCreight	7-Oct-10	Email	Michelle Stevens	The purpose of the meeting was to introduce the Projects. WWI provided a fact sheet and FAQ as well as an article about wind energy and tourism. No response was received.	Yes
Natrona County Recreation Joint Powers Board - Kelly Eastes	7-Oct-10	Phone and Email	Michelle Stevens	Spoke on phone with Kelly Eastes to introduce WWI. Followed-up with Mr. Eastes via email to provide PWP I and PWP II fact sheet and FAQ's. Met in person with Mr. Eastes on Friday, November 12.	Yes

Table 4-1 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
Converse County School District #1 - Superintendent Dr. Dan Espeland	18-Nov-10	Phone	George Blankenship	Elementary school capacity constrained, using modulars and building a new school. Middle and High school have capacity. Would like to coordinate if transporting WTGs by Moss Agate School.	Yes
Evansville - Town Clerk Janelle Underwood	16-Nov-10	Phone	George Blankenship	Discussed experience with previous Glenrock area wind energy construction projects.	Yes
Rolling Hills - Town Clerk Teresa Montgomery	18 -Nov-10	Phone	George Blankenship	Discussed services provided by the town.	Yes
Converse County School District # 2 - Superintendent Kirk Hughes	22-Nov-10	Phone	George Blankenship	Discussed experience with previous Glenrock area wind energy construction projects. Saw no impact to schools.	Yes
Evansville Mayor Phil Hines	19-Nov-10	Phone	George Blankenship	The purpose of the meeting was to discuss experience with previous Glenrock area wind energy construction projects and Douglas infrastructure capacities.	Yes
Converse County Commissioners	07-Dec-10	In-person	Christine Mikell, Sam Lichenstein	The purpose of this meeting was to provide an update to the Commissioners and an overview of the information that we provided at the Glenrock open house. We showed maps and provided updates about roads, progress on completing the application for the county permit (they mentioned that they would like a one week's notice before we submit) and that our ISC application would be filed next year. We discussed a specific group's interest in wind farm viewshed and discussed that we are addressing their interests by taking additional visual simulations. We discussed our intent to implement radar technology to keep the turbine lights off unless an aircraft approaches but that ultimately, lighting decisions are made by the FAA.	Yes

WWI received one reply to this notification from a local governing body. This reply was from the Town of Glenrock and was dated October 19, 2010. In the letter, Glenrock expressed concern over potential contamination of the town's groundwater supply by PWP I and II. After receiving the letter, WWI contracted with Bowen Collins & Associates, Inc. (Bowen Collins), a third-party engineering firm, to assess the potential of Projects' infrastructure to cause groundwater contamination. Bowen Collins concluded that PWP I and II have little potential to impact water quality in the Town of Glenrock's water supply wells. They recommended that a Construction Storm Water Pollution Prevention Plan (SWPPP) be developed for the Projects. The SWPPP will be developed in conjunction with PWP I LLC's and PWP II, LLC WyPDES permit identified in Table 3-5. The SWPPP will address sensitive watershed areas, such as those containing perennial streams and karst topography that could be linked to groundwater recharge areas and be adversely affected by soil disturbance during construction. Bowen Collins also recommended that WWI consider locating storage areas for even small quantities of oils and lubricants used in operation and maintenance of the wind farm, outside of any delineated wellhead protection zones. WWI intends to comply with this recommendation. Additionally, PWPLLC has committed to conduct a baseline study of the groundwater quality both before and after the project to ensure that Glenrock's water supply has not been compromised due to the construction of the Projects. This study will include sampling and analysis for chemical parameters of concern such as turbidity, total dissolved solids, pH, specific conductivity, and common ions.

The letter from the Town of Glenrock identifying their concern, as well as WWI's response including the assessment by Bowen Collins is attached as Exhibit 4 in Appendix D.

Having only received one response to our notification letter, WWI followed up with each local governing body during the week of November 5, 2010 to inquire whether additional local governing bodies planned to submit any potential issues, questions or concerns. Only one additional local governing body, the Converse County Tourism Promotion Joint Powers Board (JPB), made any comments during this round of calls. The Converse County Tourism JPB expressed the hope that WWI will encourage visiting labor to stay at hotels in Glenrock and Douglas before they consider Casper in order to keep lodging tax dollars in Converse County. WWI has agreed to do so.

WWI will continue its outreach and communication efforts throughout the application, construction and operating of the Projects.

4.2.2 Communication with State and Local Agencies

Throughout the development process, WWI representatives have met and will continue to meet with local and state agencies to provide notification about the proposed Projects and to discuss and coordinate plans for development. This agency coordination effort includes communication with local law enforcement, emergency management and emergency response agencies in Converse and Natrona counties; local public works employees and agencies regarding water and waste disposal plans; the Office of the former Governor Dave Freudenthal, his advisors and planning office; Wyoming Game and Fish Department (WGFD) representatives to discuss wildlife survey protocols; State Historic Preservation Office to discuss preliminary archaeological data acquired for the area and identify agency concerns and regulatory requirements; Wyoming's Department of Environmental Quality; the Wyoming Office of State Lands to discuss WWI's interest in leasing certain State Lands; the Wyoming Department of Transportation and local transportation agencies to coordinate transportation plans; and Wyoming Department of Workforce Services.

In addition to meetings with these State and Local Agencies, WWI sent certified written notifications about the Projects, including maps and project information, to several key state agencies via certified mail. WWI received one reply to the written notifications to state agencies, that from the Wyoming Game and Fish Department. This reply was dated December 2, 2010 and is attached as Exhibit 5 in Appendix D. In their reply the WGFD expressed their appreciation for the continued opportunity to work with Wasatch Wind, consultants and affected landowners as the Projects move forward. They also expressed that timing of the WWI Industrial Siting Application will make it difficult for WGFD to provide complete recommendations to the ISC due to the fact that the WGFD Commission's Recommendations, adopted November 17, 2010, recommend two years of baseline data. WWI is engaged in ongoing dialogue with WGFD regarding this issue.

Outreach and meetings with State and Local Agencies are described in Table 4-2, below. Resource-specific information obtained through WWI's coordination with State and local agencies is contained in other sections of this Application, as appropriate.

Table 4-2 State and Local Agency Coordination.

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
Wyoming Game and Fish Department (WGFD) - Mary Flanderka, Scott Gamo, Rick Huber	11-Feb-10	In Person	John Aubrecht, Christine Mikell, Spencer Martin, Doug Faulkner, (SWCA Environmental Consultants)	The purpose of the meeting was to introduce the Pioneer projects to WGFD staff. SWCA presented results of desktop environmental analysis for vegetation, wetlands, and wildlife. WWI solicited WGFD input on type, timing, and duration of required pre-construction wildlife surveys.	Yes
Industrial Siting Division (ISD) - Tom Schroeder and Todd Parfitt	17-Feb-10	In Person	John Aubrecht and Christine Mikell, Spencer Martin, (SWCA)	The purpose of the meeting was to discuss the permitting process, associated timelines, agency coordination, and permit requirements.	Yes
WGFD - Mary Flanderka, Scott Gamo, Rick Huber, Daryl Lutz, Al Conder (via telecon)	19-Mar-10	In Person	John Aubrecht, Christine Mikell (WWI), Spencer Martin, Doug Faulkner, Larry Semo (SWCA Environmental Consultants)	The purpose of the meeting was for SWCA to present proposed survey protocols for WGFD review and input. Input from this meeting was incorporated in the proposed survey protocols provided to WGFD on May 14, 2010.	Yes
Wyoming State Historic Preservation Office (SHPO) - Mary Hopkins (via phone), Richard Currit, Laura Nowlin	19-Mar-10	Phone	John Aubrecht, Christine Mikell, Spencer Martin (SWCA Environmental Consultants)	The purpose of the meeting was to introduce the Pioneer projects to SHPO staff. WWI presented results of desktop environmental analysis for cultural resources. WWI solicited SHPO input on cultural resource concerns, survey, and compliance requirements.	Yes
WGFD - Scott Gamo, Mary Flanderka, Rick Huber	4-May-10	In Person	John Aubrecht, Christine Mikell	WWI met with WGFD to discuss the timing and duration of pre-construction surveys relative to the 2-year pre-construction surveys identified in WGFD's recently adopted Wildlife Protection Recommendations for Wind Energy Development in Wyoming. WGFD suggested increasing spring and fall avian survey frequency to once per week in accordance with new Recommendations. WGFD suggested paying particular attention to Golden Eagle use of the site given the recent eagle mortalities at other wind farms.	Yes

Table 4-2 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
ISD - Todd Parfitt, Tom Schroeder, John Burbidge (AG Office)	4-May-10	In Person	John Aubrecht, Christine Mikell, Spencer Martin, John Masterson (legal counsel)	The purpose of the jurisdictional meeting was to initiate the ISC Section 109 Permit Application process for the Pioneer Wind Park projects.	Yes
Wyoming Office of State Lands and Investments (OSLI) - Ed Grant, Russ Noel, Butch Parks	20-May-10	In Person	Michelle Stevens, John Aubrecht	The purpose of the meeting was to discuss the up-coming State Lands Board Meeting at which PWP I and PWP II state lands will be considered.	No
Wyoming Superintendent of Public Instruction - Dr. Jim McBride	20-May-10	In Person	John Aubrecht, Michelle Stevens	The purpose of the meeting was to discuss the up-coming State Lands Board Meeting at which WWI intended to ask for consideration of a lease for State Lands in the PWP I and PWP II project area.	No
Wyoming Deputy State Auditor and Wyoming State Treasurer - Vicci Colgan, Joe Meyer	20-May-10	In Person	John Aubrecht, Michelle Stevens	The purpose of the meeting was to discuss the up-coming State Lands Board Meeting at which WWI intended to ask for consideration of a lease for State Lands in the PWP I and PWP II project areas.	No
Wyoming Secretary of State - Max Maxfield	20-May-10	In Person	John Aubrecht, Michelle Stevens	The purpose of the meeting was to discuss the up-coming State Lands Board Meeting at which WWI intended to ask for consideration of a lease for State Lands in the PWP I and PWP II project areas.	No
Deputy Chief of Staff to Governor Freudenthal - Ryan Lance	21-May-10	In Person	John Aubrecht, Michelle Stevens	The purpose of the meeting was to discuss the up-coming State Lands Board Meeting at which WWI intended to ask for consideration of a lease for State Lands in the PWP I and PWP II project areas.	No
Wyoming State Auditor – Rita Meyer	27-May-10	Phone	John Aubrecht, Michelle Stevens	The purpose of the meeting was to discuss the up-coming State Lands Board Meeting at which WWI intended to ask for consideration of a lease for State Lands in the PWP I and PWP II project areas.	No

Table 4-2 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
US Fish and Wildlife (USFWS) - Scott Covington, Trish Sweanor	9-Jun-10	Phone	Spencer Martin, Christine Mikell, Doug Faulkner (SWCA Environmental Consultants)	The purpose of this meeting was to coordinate with FWS, inform them of the surveys and data that had been collected to date, and to get input and concurrence on migratory bird and raptor surveys being conducted for the projects. FWS suggested mapping the raptor prey base, recording raptor flight patterns and use of the project area using a grid approach, and evaluating bald eagle use of area ponds.	No
OSLI - Ed Grant, Susan McBride	10-Jun-10	Phone	Michelle Stevens, John Masterson	The purpose of the meeting was to discuss the letter that was sent to OSLI by NLRA on May 25, 2010 and to answer questions.	No
Wind Energy Task Force - Representative Kermit Brown	10-Jun-10	Phone	Michelle Stevens	The purpose of the meeting was to discuss the response to the letter that was sent to investors by NLRA and copied Mr. Brown. He had no questions and simply wanted to know if we'd be using eminent domain in our Pioneer projects. We told him we will not use eminent domain.	No
ISD - Tom Schroeder	30-Jun-10	In Person	John Aubrecht, Spencer Reed, Christine Mikell George Blankenship	Tom Schroeder went through an agenda that included the following: • Protocol for after submission of application • Defining in the Area of Significance • Defining the Area Primarily Affected • Study area to include Converse and Natrona Counties, 4 cities in Natrona, cities in Converse County • What terminology to use • How the application should look (ex. Gantt charts, site plans, etc.) • New requirements (WGF recommendations, notice to mineral owners, etc.) • Financial capability • Reclamation (bonds for construction and termination) • Notice of completeness of filing • Completeness of application	Yes

Table 4-2 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
WGFD - Scott Gamo, Mary Flanderka, Daryl Lutz, Rick Huber	30-Jun-10	In Person	John Aubrecht, Christine Mikell, Larry Semo (SWCA Environmental Consultants)	The purpose of this meeting was to present the interim results of biological surveys conducted through May 2010 and to solicit WGFD input on the quantity and quality of data resulting from those surveys to date. WGFD indicated its satisfaction with the survey efforts completed to date and agreed that the data seemed consistent with what was predicted.	Yes
USFWS – Patricia Sweanor, Scott Covington	19-Aug-10	E-mail	Spencer Martin via Doug Faulkner (SWCA)	USFWS provided input on biological survey protocols, particularly with respect to Golden Eagles and other raptors.	No
WY Department of Transportation (WYDOT) - Mark Williams, Lowell Fleenor	8-Sep-10	In Person	Christine Mikell, George Blankenship	The purpose of the meeting was to discuss the access routes so they can comment on our permit application. They suggested bringing GE with us to next meeting to talk about preferred access routes from WY state roads. They asked for a fairly detailed traffic plan for large roads.	Yes
WGFD, Casper - Al Conder, Daryl Lutz	8-Sep-10	In Person	Christine Mikell	The purpose of the meeting was to discuss the possible project layouts. WGFD wants to look at PWP I after it is staked. This will meet the WGF's recommendations for a preconstruction site visit.	Yes
Converse County Emergency Management Agency - Russ Dalgarn	8-Sep-10	Phone	Monica Bonner	The purpose of the meeting was to discuss potential impacts by the construction and operation of the Pioneer Wind Park I and Pioneer Wind Park II.	No
ISD - Tom Schroeder	9-Sep-10	In Person	Christine Mikell Spencer Martin, Brent Kunz (WWI Legal Counsel)	The purpose of the meeting was to provide the ISD with a map showing the preliminary site plan. The map had the initial PWP I and PWP II turbine layouts and appurtenant facilities. The project description/notification letter was also discussed along with the project open house, housing availability assessment, financial capacity and assurance, and the pre-filing meeting.	Yes

Table 4-2 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
Wyoming Department of Workforce Services - Linda Ally, Susan Dziardziel	9-Sep-10	In Person	George Blankenship	The purpose of the meeting was to introduce the projects. The Department of Workforce Services would be happy to co-host a job fair with WWI, PWP I, LLC and PWP II, LLC and its EPCM contractor and subs to recruit local workers. They would publicize the meeting(s) in the local media.	Yes
WGFD - Rick Hubener	9-Sep-10	In Person	Christine Mikell, Spencer Martin	The purpose of the meeting was to discuss terrestrial and aquatic wildlife issues within the project areas and provide WGFD with the preliminary site plan. WGFD inquired about truck travel through mule deer crucial range from November 15 to April 30. WWI will check back with Daryl Lutz (WGFD-Casper) for resolution	Yes
Natrona County Fire District - Kevin Finn	9-Sep-10	Phone	Monica Bonner	The purpose of the meeting was to discuss potential impacts by the construction and operation of the Pioneer Wind Park I and Pioneer Wind Park II on the district.	No
Glenrock Public Works Director - Dave Andrews	9-Sep-10	In Person	George Blankenship	The purpose of the meeting was to discuss infrastructure issues.	Yes
Converse County Sheriff Clint Becker	14-Sep-10	In Person	Sam Lichenstein	The purpose of the meeting was to introduce the projects. We need to coordinate the turbine deliveries with him as he will help with traffic. Discussed the use of local vendors. All of our vehicles and our contractor's vehicles at a minimum must have temporary Wyoming registration.	No
Wyoming Department of Family Services, Mary Anne Maidl, Supervisor	14-Sep-10	Phone	George Blankenship	The purpose of the meeting was to introduce the projects. They foresee no impacts from wind projects.	No

Table 4-2 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
WGFD, USFWS - Daryl Lutz, Andrea Orabona, Gary Boyd, Justin Binfet, Matt Hahn (WGFD); Patricia Sweanor (USFWS)	17-Sep-10	In Person	Spencer Martin; Doug Faulkner (SWCA)	The purpose of the meeting was to discuss road improvement issues, timing relative to mule deer crucial winter range restrictions, construction traffic, wildlife surveys, and project access routes. WGFD provided input on transmission line design and monitoring, re-routing existing county road around the Mormon Canyon lek, and controlling weeds during and after construction.	Yes
Converse County Rural Fire Association - Tom Reed	29-Sep-10	Phone	Monica Bonner	The purpose of the meeting was to discuss potential impacts by the construction and operation of the Pioneer Wind Park I and Pioneer Wind Park II on the agency.	No
Douglas Fire Department - Rick Andrews	29-Sep-10	Phone	Monica Bonner	The purpose of the meeting was to discuss potential impacts of the construction and operation of the Pioneer Wind Park I and Pioneer Wind Park II on the agency.	No
Douglas Police Department	29-Sep-10	Phone	Monica Bonner	Left Message	No
Glenrock Fire Department	29-Sep-10	Phone	Monica Bonner	Left Message	No
Glenrock Hospital District - Melanie Cielinski	29-Sep-10	Phone	Monica Bonner	The purpose of the meeting was to discuss potential impacts by the construction and operation of the Pioneer Wind Park I and Pioneer Wind Park II on the agency.	No
Glenrock Police Department	29-Sep-10	Phone	Monica Bonner	Left Message	No
Natrona County Emergency Management Agency - Stewart Anderson	29-Sep-10	Phone	Monica Bonner	The purpose of the meeting was to discuss potential impacts by the construction and operation of the Pioneer Wind Park I and Pioneer Wind Park II on the agency.	No
Natrona County Sheriff's Department	29-Sep-10	Phone	Monica Bonner	Left Message	No
Wyoming Medical Center	29-Sep-10	Phone	Monica Bonner	Left Message	No
Converse County Memorial Hospital - Tom Nordwick	1-Oct-10	Phone	Monica Bonner	The purpose of the meeting was to discuss potential impacts by the construction and operation of the Pioneer Wind Park I and Pioneer Wind Park II on the hospital.	No

Table 4-2 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
Converse County Health Department - Sharon Kilmer	4-Oct-10	Phone	Monica Bonner	The purpose of the meeting was to discuss potential impacts by the construction and operation of the Pioneer Wind Park I and Pioneer Wind Park II.	No
Wyoming Life Flight	4-Oct-10	Phone	Monica Bonner	Left Message	No
OSLI - Marty Matsen, Russ Noel, Don Threewitt	5-Oct-10	In Person	Christine Mikell	The purpose of the meeting was to discuss the state lands associated with the Pioneer Wind Park I and Pioneer Wind Park II. The Director would like us to wait until after December to go before the State Lands Board. We discussed tax revenue issues as well.	No
WGFD - Scott Gamo	5-Oct-10	In Person	Christine Mikell	The purpose of the meeting was to discuss wildlife restrictions. We should plan to meet again once fall migration is over to discuss the passage rates. He was supportive of our survey protocol.	Yes
OSLI - Susan Child, Judge Grant, Marty Martsen,	6-Oct-10	In Person	Christine Mikell	The purpose of the meeting was to discuss the timing of WWI's State Land Board meeting as well as the legal issues involved. Landowner and supporter participation was strongly encouraged. We also discussed the different outcomes of private and public land turbine placement.	No
Glenrock Public Works - Dave Andrews	6-Oct-10	In Person	Christine Mikell	The purpose of the meeting was to discuss how public works can help us with the water issues. We discussed solid waste, construction debris, and demolition waste removal, as well as issues pertaining to lost property values, noise, loss of isolation and insulation, and visual impacts.	Yes
ISD STAFF - Tom Schroeder, Laura Yetter, Todd Parfitt	18-Oct-10	In Person	Spencer Martin, Brent Kunz (WWI legal counsel)	The purpose of this meeting was to check in with Tom Schroeder and answer questions pertaining to cultural resource surveys, pre-construction wildlife surveys, county permit timing, ISC permit timing and notification.	Yes

Table 4-2 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
WYDOT - Lowell Fleenor, Mark Williams	25-Oct-10	In Person	Christine Mikell, Rob Bennett (CEPI Engineers)	The purpose of the meeting was to discuss using Windy Ridge as an access road. They are expecting a letter from us about using that road. They will have one road use agreement for all the roads, interchanges and ramps that we will use. We should contact CCSD#1 as the route goes by a rural school.	Yes
Casper Mountain Fire District - Mike Huber	4-Nov-10	Phone	Monica Bonner	The purpose of the meeting was to discuss potential impacts on the district by the construction and operation of the Pioneer Wind Park I and Pioneer Wind Park II.	No
ISD - Tom Schroeder, Todd Parfitt, Laura Yetter	8-Nov-10	In Person	Brent Kunz (WWI legal counsel), John Masterson (WWI legal counsel), Spencer Martin and Christine Mikell	The purpose of this pre-filing meeting was to discuss the key aspects of the permit application, who can be a party to the permit process, likely hearing location, communication procedures following the filing, ISD and state agency review periods and procedures, addressing deficiencies, and responding to comments.	Yes
Glenrock Police Department - Chief Tom Sweet	08-Nov-10	Phone	George Blankenship	The purpose of this call was to discuss the department's experience with previous wind energy construction projects. Has not had much impact in terms of traffic control. Has had a few alcohol-related incidents and other routine calls.	No
Wyoming Department of Family Services Casper Office, Carol Byer, Supervisor	08-Nov-10	Phone	George Blankenship	The purpose of the meeting was to discuss previous experience with wind energy construction projects. Family Services caseloads do not appear to have been affected.	No
Wyoming State Engineers Office (Ground Water Division) - John Harju	9-Nov-10	In Person	Christine Mikell	The purpose of the meeting was to discuss water permitting for PWP I and PWP II	Yes
Converse County Sheriff's Office - Sheriff Clint Becker	09-Nov-10	Meeting	Christine Mikell Spencer Martin George Blankenship	The purpose of the meeting was to discuss previous experience with wind energy construction projects. Primary problem was workers not registering vehicles. Some calls for traffic management.	No

Table 4-2 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
ISD - Todd Parfitt, Tom Schroeder and Laura Yetter	15-Nov-10	Phone	Christine Mikell, Spencer Martin, Andrew Fales	The purpose of the meeting was to discuss financial capacity and assurance issues as well as the project and its impacts.	Yes
Converse County Weed and Pest - Cheryl Schwartzkopf	16-Nov-10	Phone	Spencer Martin	We discussed the PWP I and PWP II and a weed monitoring and management plan.	No
Converse County Agricultural Extension - Ashley Garrelts	16-Nov-10	Phone	Spencer Martin	We discussed the projects and a weed monitoring and management plan.	No
Converse County Conservation District - Michelle Huntington	30-Nov-10	Phone	Spencer Martin	Ms. Huntington had no concerns regarding the proposed Projects	No
Wyoming Public Service Commission - Chris Petri	17-Nov-10	Phone	Paige Pagnucco	The purpose of the meeting was to introduce WWI. The agency would like to have a presentation at some point about the Projects.	No
WY Department of Education - Dr. Jim McBride's Office	17-Nov-10	Phone	Paige Pagnucco	The purpose of the meeting was to inquire as to whether or not the department had any questions or concerns pertaining to the projects.	No
WY Office of State Engineer - John Harju	17-Nov-10	Phone	Paige Pagnucco	Left message 11/17	Yes
WY State Geologist	17-Nov-10	Phone	Paige Pagnucco	Left message 11/17	No
WY Dept of Agriculture - Chris Whitcomb	17-Nov-10	Phone	Paige Pagnucco	The purpose of the meeting was to introduce the projects. Mr. Whitcomb was grateful for the call and will let us know if he needs any further information. He was directed to the projects website as well.	No
WY Business Council - Kim Rightmer	17-Nov-10	Phone	Paige Pagnucco	The purpose of the meeting was to discuss the projects. Ms. Rightmer is aware of the projects and currently has no questions or concerns.	No
Dept of Fire Prevention and Electrical Safety - Kevin Booker	17-Nov-10	Phone	Paige Pagnucco	The purpose of the meeting was to discuss the projects. Mr. Booker proposed having someone from WWI come in to pick up and discuss permits and applications for licensing for electrical contractors	Yes
Wyoming Department of Family Services, Paul Yaksic, Financial Services Administrator	17-Nov-10	Phone	George Blankenship	Discussed experience with previous Glenrock area wind energy construction projects.	No

Table 4-2 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
Natrona County Sheriff's Department - Lt. Mark Sullers	18-Nov-10	Phone	George Blankenship	Discussed experience with previous Glenrock area wind energy construction projects. Major concern was speeding on access roads and gravel trucks throwing rocks through windshields.	No
Casper Police Department	18-Nov-10	Phone	George Blankenship	Discussed experience with previous Glenrock area wind energy construction projects. Major concern was workers not registering vehicles. Have had some issues with alcohol and drug-related offences	No
Glenrock Recreation District - Recreation Center Director Donnie Stewart	19-Nov-10	Phone	George Blankenship	Discussed experience with previous Glenrock area wind energy construction projects. Some construction workers have used the recreation center; no known conflicts.	No
Wyoming Department of Unemployment Insurance, Mary Peterson, Employees Services Manager	19-Nov-10	Phone	George Blankenship	Discussed Wyoming requirements for employer bonding and certificates of good standing.	Yes
Casper Area Economic Development Alliance - Noelle Wernsman, Investor Relations and Communications Manager	23-Nov-10	Phone	George Blankenship	Reported no major projects scheduled for Natrona County during next two years.	No
Wyoming Department of Family Services, Casper District Manager, Paul Fritzler.	24-Nov-10	Phone	George Blankenship	Discussed experience with previous Glenrock area wind energy construction projects.	No
Wyoming Highway Patrol District 2 (Casper) Supervisor, Captain Willie Price	29-Nov-10	Phone	George Blankenship	Discussed experience with previous Glenrock area wind energy construction projects. Major concern was workers not registering vehicles. Have had minimal traffic control issues.	No
WGFD - Scott Gamo; Rick Huber	10-Dec-10	In-person	Spencer Martin (WWI); Chris Haas (SWCA); PWP I and PWP II Landowners Rick Grant, Mark Grant, Bill DeGraeve	Discussed preliminary draft of Wildlife Conservation Plan including post-construction reclamation and revegetation of temporary use areas, weed monitoring and management, wildlife surveys and fatality monitoring, and annual reporting.	Yes

Table 4-2 (Continued)

Agency Name and Representatives	Date	Contact Method	WWI and PWP Representatives and Contractors in Attendance	Meeting Purpose and Comments	Received Certified Letter
Converse County Emergency Management agencies: Russ Dalgarn (CC Emergency Management Agency); Jay Johnson (EMS Director); Rick Grant (Zone Warden, CC Rural Fire Assoc.); Rick Andrews (Douglas Fire Department); Neala Dalgarn - Glenrock Ambulance "Supervisor"	13-Dec-10	In-person	Monica Bonner (WWI)	The purpose of this meeting was to coordinate on a specific emergency management plan. WWI gave a brief overview of the projects and answered questions concerning the exact locations of the two projects. WWI presented the information received from previous interviews and construction info and requested input based on each agency's needs. WWI indicated that a draft Emergency Management Plan would be submitted for review and another meeting set to discuss any additional questions or concerns that result from that submittal.	No
WYDOT – Casper Office - Lowell Fleenor, Mark Williams	4-Jan-11	In-Peron	Christine Mikell; Mihir Patel (GE Energy)	We discussed road access for the turbine components.	
WGFD – Rick Huber	10-Jan-11	Phone	Spencer Martin (WWI); Chris Haas (SWCA); Laura Leslie Burckhardt (SWCA)	WGFD provided comments on the draft Reconnaissance Level Assessment (RLA) and related sections of the ISC application. Their comments are addressed in our application.	Yes

4.2.3 Community Outreach

WWI is keenly aware of the issues, opinions and concerns raised by proponents and opponents of the Projects. It has been the philosophy of WWI to engage with any and all individuals or organizations to explain wind energy and the Projects, answer questions and address concerns. WWI realizes there are those who oppose the Projects and WWI respects their position. Nonetheless WWI will continue to encourage and entertain constructive dialogue regarding the Projects with any individual or group and will take all steps possible to respond to concerns raised.

WWI will provide information to the community as the development process for the Projects moves forward. To date, WWI's efforts have included meetings with community organizations, individuals, mass communications, and community events including a public Open House. WWI has received feedback from a variety of community interests and individuals and has incorporated that feedback, where possible, in the design of the project and the content of this Application.

4.2.3.1 Community Organizations

- Wasatch Wind, as the owner of WWI and its affiliates PWP I, LLC and PWP II, LLC, has joined the Chambers of Commerce in Glenrock, Douglas and the Casper Area. WWI communicates with the Chambers on a regular basis to keep their members informed of the Projects' activities and development progress. The Casper Area Chamber wrote a letter of support for Pioneer Wind Park I and II on November 8, 2010. That letter is included in Appendix D as Exhibit 6.
- On September 28, 2010, WWI hosted a breakfast for members of the Glenrock Chamber of Commerce. The event was publicized through the Glenrock Chamber's email distribution list. Approximately 20 Chamber members attended the breakfast to learn more about the Projects. WWI responded to questions form the audience about wind energy in general and the Projects in particular. The group was particularly interested in updates about road access to the project. Audience members also noted that the town of Glenrock had seen a boost to business during construction of other Converse County wind farms and were interested in whether the Projects would generate the same boost. Wyoming Senate President Jim Anderson from Converse County suggested that WWI try to provide non internet-based ways for the community to learn about the project and

contact WWI for more information. As such, we have advertised in local newspapers and radio and include a contact phone number in these advertisements in addition to the Projects' URL. Additionally, we have participated in community events; scheduled in-person meetings with area residents and community groups; distributed fact sheets; provided several in-person updates in a public setting to the Board of Converse County Commissioners; hosted an open house for the public in Glenrock and are currently in the process of scheduling additional community events; and have proactively and reactively provided information to the media so that information about the Projects would be distributed en masse through the local media outlets.

- WWI has met with the Casper Area Economic Development Association (CAEDA) and the Converse Area New Economic Development Organization (CANDO) to discuss economic impacts that the Projects will generate and to learn about impacts they have observed from other wind projects as well as address questions they have about the Projects. Both CAEDA and CANDO were interested in understanding how other Converse County wind energy projects had impacted and will impact their areas economically. CANDO was also interested in the economic and social impacts that Pioneer Wind Park I and II will have on the local community. Following WWI's meeting with CANDO on January 12, 2011, CANDO wrote a letter thanking WWI for presenting to the CANDO Board. The letter also notes that CANDO recognizes the "good faith effort to be a contributing a conscientious corporate citizen." The letter from CANDO is attached as Exhibit 7 in Appendix D.
- On September 14, 2010, WWI met with the Glenrock Recreation Board. One member was concerned about hunting access, and WWI explained that under our leases, the landowner retains the right to manage their land as they see fit, including decisions about granting access for hunting. The group as a whole was interested in understanding the tax revenue that would be generated by the project and allocated to the recreation board.
- WWI introduced the Projects to Converse County business leaders during the July 28, 2010, meeting with the Douglas Rotary Club. In August, 2010, a WWI representative volunteered public service time with the Douglas Rotary during the Wyoming State Fair in Douglas that month.
- WWI presented information about the Projects to the Renewable Energy Alliance of Landowners (REAL) group on October 1, 2010. The group was interested in how PWP I

and II are progressing. REAL has submitted a letter in support of the Projects which is included as Exhibit 8 in Appendix D.

- In an ongoing attempt to make a positive contribution in the community, WWI has participated in events hosted by several important local organizations including: Future Farmers Association (FFA); Converse County Stockgrowers; Women in Ag; Rocky Mountain Elk; Glenrock Recreation Center.
- WWI is aware of organized opposition to the Projects from the Northern Laramie Range Alliance (NLRA). WWI has proactively reached out to the NLRA multiple times over the last two years with the goal of engaging them in constructive dialogue. WWI has met and communicated with members of the NLRA Steering Committee in person, on the phone and via email, at our request, in attempts to discuss and hopefully address their concerns about wind development in the area and to discuss specific turbine locations.
    - WWI has met with and communicated with members of the NLRA Steering Committee in-person, on the phone and via email, at our request, in attempts to discuss and hopefully address their concerns about wind development in the area and to discuss specific project issues and siting locations. The NLRA has communicated that because they do not want to see any development of any kind in the area of the Projects, it will not be possible for WWI to address their concerns.
    - Despite their position, WWI would note that in response to concerns expressed by the NLRA and others during the early stages of investigating the project, WWI significantly altered and reduced the State Land acreage being investigated as well as the total project acreage initially considered. Specifically, WWI excluded from consideration a large area of State Lands, including the Duncan Ranch and Pinetree Cattle Company's grazing lease. WWI further responded by discontinuing project investigations on private lands in areas where concerns were expressed.
    - WWI invited NLRA to the November 9th Open House (See Exhibit 9 in Appendix D.) Members of the NLRA attended and participated in the Open House.

4.2.3.2 Mass Communications

- **Direct Mail**: WWI mailed a full color brochure to approximately 4,000 residents of Converse County in October 2010 to educate the community about Pioneer Wind Park I and II. The brochure included a postage-paid mail back card if residents wanted more information or wanted to voice their support for the two Projects. Those that requested more information received a phone call and/or letter with more information about PWP I and II. As of December 8, 2010, of the approximately 4,000 brochures mailed, we received 125 unique responses. Fifty-eight percent indicated support for the Projects, nineteen percent requested more information, eighteen percent indicated opposition to the Projects and five percent did not indicate a leaning. A copy of the brochure is included in Appendix D as Exhibit 10.
- **Media Outreach**: WWI engages in consistent conversations with media in the area of the Projects in order to provide information about the Projects to the local community. WWI has engaged in both proactive and reactive media outreach. Proactively, WWI has issued several press releases during the development process to announce significant milestones and topics of community interest. Wasatch Wind Intermountain will continue to notify the media in order to provide information to the public when significant topics of interest occur. In addition to proactive efforts, WWI has responded to dozens of requests from media for interviews and information about the Projects. As such, dozens of articles have been written in the local media in Converse and Natrona Counties over the past year. WWI keeps the website for the projects (http://www.pioneerwindpark.com) updated with these articles. Copies of the press releases are included as Exhibit 11 in Appendix D.
- **Pioneer Wind Projects Website**: A website for Pioneer Wind Park I and II (http://www.pioneerwindpark.com) was launched and made available to the public on July 8, 2010. WWI has been keeping the website updated as development progresses. A picture of the website is included in Appendix D as Exhibit 12.
- **Corporate Website**: A website for Wasatch Wind Intermountain is also available for additional information about the development company for PWP I and II and its work (http://www.wasatchwind.com).

4.2.3.3 Public Events

- **Deer Creek Grazing Days**: WWI had a booth at Glenrock's Deer Creek Grazing Days in August 2010. This is an annual event and the most popular event in Glenrock during the year. It draws crowds from Glenrock, Douglas, Converse, Natrona Counties and around the state. WWI representatives distributed educational information about PWP I and II to more than 100 event attendees and also discussed and answered questions about the Projects. More than 80 people signed up to receive ongoing information about the Projects and approximately 70 people registered their support for PWP I and II.
- **Open House**: An Open House for the community was held on November 9, 2010, from 6-9pm in the Glenrock Recreation Center Gymnasium. The Open House was organized in a kiosk format in which attendees could move from table to table displaying a variety of information about PWP I and II and meet WWI representatives. Twenty WWI representatives were on hand to meet with the community and answer questions. The representatives that were at hand are experts with a range of specialties including wildlife, landowner concerns, construction, wind energy, turbines, finance, socioeconomic benefits and impacts, and community impacts. WWI displayed 22 boards providing information about PWP I and II and about wind energy in general. Boards included: maps of the two project areas with preliminary turbine locations; visual simulations created from various locations within and adjacent to the project areas; information on the wildlife and cultural studies being conducted; general information about the Projects and FAQ's; socioeconomic impacts; a summary of taxes that will be generated; decommissioning requirements; and impacts on hunting and land use. WWI provided food and beverages as well as games and activities for children. The Open House was well attended with more than 150 interested visitors.
    - The Pioneer Wind Park Open House was publicized through multiple print and radio advertisements in both Converse and Natrona Counties (Table 4-3); media coverage in local papers; a postcard invitation mailed to Converse County residents; emails through the Casper Area, Douglas and Glenrock Chamber distribution lists; on the http://www.pioneerwindpark.com website; and calls and emails to local and statewide elected officials. The postcard invitation and newspaper ads are attached as Exhibits 13 and 14 in Appendix D.

Table 4-3 Advertising Schedule to Publicize November 9th Open House

Media Outlet	Notice Date	Advertising Method
Douglas Budget newspaper (Converse County)	27-Oct-10 and 3-Nov-10	1/4-page, full-color ads
Glenrock Independent newspaper (Converse County)	28-Oct-10 and 4-Nov-10	1/4-page, full-color ads
Casper Journal (delivered to most households in Natrona County)	27-Oct-10 and 3-Nov-10	1/4-page, full-color ads
Glenrock Bird (Converse County)	31-Oct-10 and 7-Nov-10	1/4-page, full-color ads
KTWO-Casper (Natrona County)	5,6,7,8,9-Nov-10	2 drive time spots/day (10 total) and 1 Brian Scott in the Morning interview* the day before Open House
KYOD-Douglas (Converse County)	4,5,6,7,8,9-Nov-10	3 drive time spots/day (18 total)

- Following the Open House, WWI placed Thank You Ads in the local newspapers of Converse County (Table 4-4) to thank those who attended the Open House and to again provide contact information for anyone who missed the Open House or wanted additional information. The Thank you Ad is attached as Exhibit 15 in Appendix D.

Table 4-4 Advertising Schedule to Thank Community for Open House and Provide Contact Information for WWI.

Media Outlet	Notice Date	Advertising Method
Glenrock Independent newspaper (Converse County)	18-November-2010	1/4-page, full-color ads
Douglas Budget newspaper (Converse County)	17-November-2010	1/4-page, full-color ads
The Glenrock Bird	21-November-2010	1/4-page, full-color ads

4.2.4 Questions and Answers

The types and nature of the questions posed were similar across all meetings and included such topics as:

- Road Access and Transportation
  - Which roads will we use to access the project site?
  - Will roads have to be improved?
  - Is winter road maintenance a concern?
- Wildlife and Cultural Resources
  - Will the turbines scare big game away?
  - Will WWI destroy local historical artifacts?
  - Are you working with Wyoming Game and Fish Department?
- Tax Revenue
  - Will WWI pay its taxes? (A question apparently based on past experience with a previous Converse County wind farm)
  - What taxes will WWI pay?
- Jobs (Local Labor Use) and Workforce Economic Impact (Long and Short Term)
  - How many people will be hired from the local area?
  - How many long-term jobs will be created?
  - Where will visiting labor stay?
  - Will subcontractors pay their bills? (A question apparently based on past experience with a previous Converse County wind farm)
- Visual Impact
  - From where will I see the turbines?
  - Can you paint the turbines desert tan?
  - Have you considered technology to keep the night skies dark?
  - Why did you choose the mountains?
- Turbine Placement and Size
  - Where will the turbines be located?
  - How many turbines and what size?
- Potential Use of State Lands
- Construction Issues (i.e., water, sewer, debris removal)
  - When will construction begin? What is the timeline for construction?
  - How will we get water to the site?

- o Will the turbines be removed once the windfarm is done?
- o How will waste be disposed?
- o How will weeds be managed?
- o Will the turbines pollute the water supply?

- Federal Subsidies
  - o How much of my tax dollars go to subsidizing the wind industry?
  - o How much is each turbine subsidized?
- Economic Benefits
  - o Where will visiting labor stay?
  - o How will the county realize benefits of the taxes paid?
  - o How have other Converse County wind projects benefitted us?
- Transmission Line and Power Grid Stability
  - o Will WWI use eminent domain for the connection line?
  - o Will WWI need Gateway West transmission line in order to be built?
  - o Will the wind energy increase my electricity bill?
- Property Values
  - o Will the wind turbines decrease my property value?
  - o How will WWI compensate neighboring landowners if property values decrease?
- Hunting/ Recreational Use
  - o Can I still hunt and recreate in the area?
- Emergency Procedures
  - o How will emergency management know where to find a worker if injured?
  - o Will traffic be controlled?
- Financing the project
  - o Where will WWI get the money to pay for the project?

Many of the above questions are addressed in other portions of this Application and some are addressed in Section 4.2.5 below.

WWI representatives answered all questions to the best of their knowledge and intend to keep interested parties apprised as more questions are answered as development progresses. It is WWI's policy to make every effort to have its representatives available and responsive to inquiries and comments.

4.2.5 WWI Responses to Community Concerns

The primary concern of the community appears to be any potential visual and aesthetic impact. Specifically, some in the community have voiced concern about seeing lights at night because of the location of the Projects in a rural area. Some in the community appear to also be concerned about seeing the turbines from various vantage points in the community. Additionally, some are concerned that having turbines will create an industrial feel in the area. WWI has been working to address these visual and aesthetic concerns in several ways.

- PWP I, LLC and PWP II, LLC will be committed to using radar technology that keeps aviation/aircraft warning lights located on turbines off during the night unless a low-flying aircraft is approaching. WWI has met with two radar technology companies and is committed to the additional expense of installing one of the two available radar technologies and is in the process of selecting the system and the vendor. Any radar technology will have to be approved by the FAA specifically for PWP I and II.
- Regarding visual concerns, WWI has engaged the community about vantage points they care about most, including the town of Glenrock and the I-25 corridor, and conducted visual simulations from seven of these key observation points (KOPs). Turbines were visible from four of the KOPs as per visual simulations generated by a firm with experience generating visual simulations for wind farms. The firm prepared the photosimulations by integrating real photographs from the area of the Projects with a computer model of the proposed wind turbines to provide a realistic image of what the proposed projects would look like if they are constructed. These four visual simulations were displayed at the community Open House in Glenrock. WWI is currently working on additional visual simulations from additional KOPs as requested by individuals and groups in the community who are concerned about KOPs not included in the initial seven. Refer to Section 6.11 for a detailed assessment of the Projects' impacts on scenic resources.
- One area of particular scenic resource concern to the community is on State Lands known as the Duncan Ranch Management Area. The Duncan Ranch is popular for its aesthetic appeal and recreation. WWI had initially submitted an application to lease certain State Lands within the Duncan Ranch Management Area because wind energy is listed as a possible use for those lands in the Duncan Ranch Coordinated Resource Management

Plan (page 5 of the Coordinated Resource Management Plan for the Duncan Ranch, dated June 7, 2007 - http://slf-web.state.wy.us/webboard/0607/finalduncanranchcrmplan.pdf). After doing so, WWI heard from several in the community who expressed concerns about wind energy development on the Duncan Ranch, leading WWI to withdraw those 4,092 acres from its lease application with the Office of State Lands and from consideration for wind energy development out of deference to these expressed community concerns.

- WWI abandoned consideration of lands south of the current project locations due to concerns voiced by the community. In doing so, WWI released 880 acres of private lands that were leased in that area and any acreage that it had applied to lease with the Office of State Lands and Investments.

A second concern of several members of the community is the potential effect on property values due to the proximity of the wind farm. Although the most recent and comprehensive scientific study to date conducted about property values and wind farms shows that neither proximity to nor views of wind farms is found to have any consistent, measurable, and statistically significant effect on home sale prices,[2] (December 2009, Ernest Orlando Lawrence Berkeley National Laboratory - http://eetd.lbl.gov/ea/ems/reports/lbnl-2829e.pdf), WWI is working diligently to address the concerns of those who will live in close proximity to the projects. WWI has conducted a viewshed analysis to examine whether those concerned will be able to see the Projects from their homes. There are a total of 27 landowners with structures on their property within 5 miles of the turbine boundary. Of those 27 landowners, 8 are landowners participating in the Pioneer Wind Park projects. Therefore, there are 19 non-participating landowners' homes within 5 miles of the turbine boundaries for Pioneer Wind Park I and II. The closest non-participating landowner's home is located approximately 0.9 miles from the nearest proposed turbine. WWI has met with several of the landowners who have expressed concerns and will continue to meet with those concerned about property values in the coming months.

A third concern of some in the area is the loss in character of the curvy narrow roads in the area if the roads are used to transport wind farm infrastructure and therefore need to be straightened and improved. Boxelder Road was initially considered for infrastructure transport and seems to be the most traveled road

[2] (December 2009, Ernest Orlando Lawrence Berkeley National Laboratory, *The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis* - http://eetd.lbl.gov/ea/ems/reports/lbnl-2829e.pdf)

in the area by residents and visitors. WWI is no longer considering Boxelder Road as an access route option. Another route contemplated and preferred for access to the Projects is Mormon Canyon Road. Whereas some individuals have expressed concerns about improving roads in the area, other area residents and the Converse County School District #2 have stated support for improving Mormon Canyon Road for safety reasons and better year round access. Initial surveys by an EPC consultant indicate that the best approach may be to upgrade the Mormon Canyon Road but keep its alignment intact. Windy Ridge is an optional route that WWI is considering for access to the site and, like Mormon Canyon, there have been concerns expressed about improvements to this route as well.

Another concern in the area is that WWI will not pay any taxes and therefore not provide any economic benefits to the local area. Some of the concern stems from the fact that residents are simply not aware of the taxes paid by operating wind projects or where the taxes go once paid. For example, not all residents are aware that Converse County already receives tax proceeds from the existing wind development in the County. PWP I, LLC and PWP II, LLC will honor its obligations under Wyoming tax laws. In the meantime, WWI is working to educate the community that the Projects will be subject to taxation that will benefit Converse County.

Access to hunting initially was a concern of residents in the area due to fears that wind development would shut down hunting access in the area. WWI has worked to provide information to the community that explains that the agreements signed by landowners to permit the development of wind energy infrastructure on their property does not restrict access to hunters nor have influence over a landowner's decision to allow hunting, except for potentially a temporary period during construction. PWP I, LLC and PWPW II, LLC leases specifically provide that the landowner retains all rights to allow access and/or hunting as they see fit. We have provided information about hunting access to the community via our fact sheets and FAQ handouts, http://www.pioneerwindpark.com, through a mailed brochure to residents of Converse County and at the Glenrock Open House.

Finally, some members of the community have expressed concerns about potential future growth of wind energy and transmission in the vicinity of the Projects. While WWI has no current plans for additional wind project development in this area of Converse County, we obviously cannot speak to the plans of other wind development and transmission companies that may become interested in the area in the future, other than to note that any new development would be subject to appropriate review and permitting and would depend on the willingness of landowners to sign agreements that would allow wind development activities to occur on their property.

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5.0 SOCIOECONOMIC ASSESSMENT

This section includes:

1. A description of the geographic area likely to be affected by the proposed Projects and provides recommendations for the Area of Site Influence and Local Governments Primarily Affected by the Projects;
2. Estimates of the construction and operations workforce including locally hired workers, in-migrating workers, wages and benefits;
3. An evaluation of the social and economic conditions in the recommended Area of Site Influence and potential effects of the proposed Projects on those conditions;
4. A description of the current land use including agricultural use in and near the proposed project sites and potential changes to such land use;
5. An analysis of the transportation network likely to be affected by the proposed Projects and a discussion of likely affects; and,
6. A fiscal analysis for local governments likely to be affected by the proposed Projects.

5.1 AREA OF SITE INFLUENCE AND LOCAL GOVERNMENTS PRIMARILY AFFECTED

5.1.1 Area of Site Influence

WWI's recommendation for the Area of Site Influence and Local Governments Primarily Affected by construction, operation and decommissioning of the PWP I and PWP II projects is guided by the location of the proposed Projects and ancillary facilities, the location of communities within reasonable commuting distance and times from the project area and by recent experience from similar Converse County wind energy projects.

As described in Section 2.4, the Projects would be located in Converse County, south of the Town of Glenrock. All project facilities including the access road, substation, transmission interconnect line and operations and maintenance facilities would be located in Converse County.

Table 5-1 displays communities within a 60-mile/one-hour commuting radius of the project sites via the Mormon Canyon Road access route. Commuting workers coming from Glenrock and communities from the west of the project area are likely to use the Mormon Canyon Road access route.

Table 5-1 Communities within 60 Miles and One-Hour Commuting Time of the PWP I and II Project Sites.

Community	Distance to Projects (miles)	Travel Time to Projects (Minutes)
Converse County*		
Glenrock	8	16
Rolling Hills	14	26
Douglas	34	42
Natrona County		
Evansville	31	44
Casper	33	47
Mills	36	52
Bar Nunn	38	53

* The Converse County Town of Lost Springs (2009 population of one person) is outside of the one-hour commuting time.
Source: Google Maps and Blankenship Consulting, LLC (BCLLC)

Commuters from Douglas, the only community east of the project area within 60 miles, may use the Sunflower Trail/Cold Springs Road/Windy Ridge Road access route, which would still be within a one-hour commute time.

Three wind energy projects have been developed in Converse County over the past three years:

- Glenrock (66 WTG, 99MW), Rolling Hills (66 WTG, 99 MW) and Glenrock III (26 WTG, 39 MW) - known collectively as the Glenrock/Rolling Hills Wind Energy Projects, located approximately 15 miles north of Glenrock, completed in January 2009;
- Campbell Hill Windpower Project (66 WTG, 99 MW), located approximately 4 to 16 miles northwest of Glenrock, completed in December 2009;
- Top of the World Windpower Project (110 WTG, 200 MW), located approximately 4 miles northeast of Glenrock, completed in late 2010.

Quarterly monitoring reports for each of these projects were submitted to ISD during construction. These reports contained information about the construction workforce by calendar quarter, including total and average number of workers, place of residence at time of hire, and place and type of residence while working on the project. Figure 5-1 displays a summary of the residency patterns for non-local workers for the peak construction workforce quarter for each of the three recent Converse County wind energy

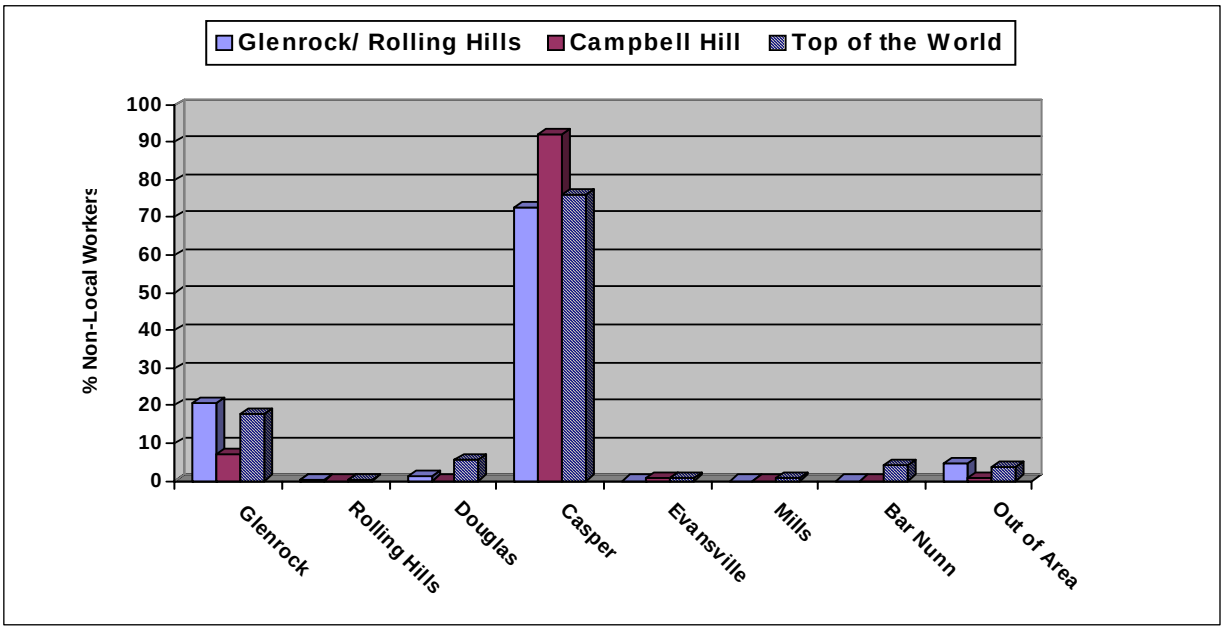


Figure 5-1 Percent Residency by Community of Peak Construction Quarter Non-Local Workers: Glenrock, Rolling Hills, Campbell Hill & Top of the World Wind Energy Projects. Sources: Peak construction quarter ISD monitoring reports: Rolling Hills/Glenrock, Campbell Hill and Top of the World wind energy projects.

projects. Based upon these reports, the communities within the defined commuting radius for the Projects hosted over 95 percent of the non-local workforce and were the source of over 92 percent of the local workforce on three previous wind energy projects in Converse County. The remaining local and non-local workers resided in more distant communities, with few workers living in any single community.

The monitoring reports further demonstrate that the vast majority of non-local construction workers lived in Converse and Natrona counties while working on the project and of those, most lived in Casper, Glenrock and to a lesser extent, Douglas. Some workers who identified themselves as living in Casper may have lived in, or stayed in, Bar Nunn, Evansville or Mills. However, local officials in these communities have stated that they were not substantially affected by previous wind energy construction projects.

As shown in Figure 5-2, the residency pattern for locally hired workers is similar. The vast majority came from communities in Converse County and the Casper area of Natrona County. A few locally hired workers reported that they commuted from Laramie, Cheyenne and communities in Campbell, Johnson and Sheridan Counties.

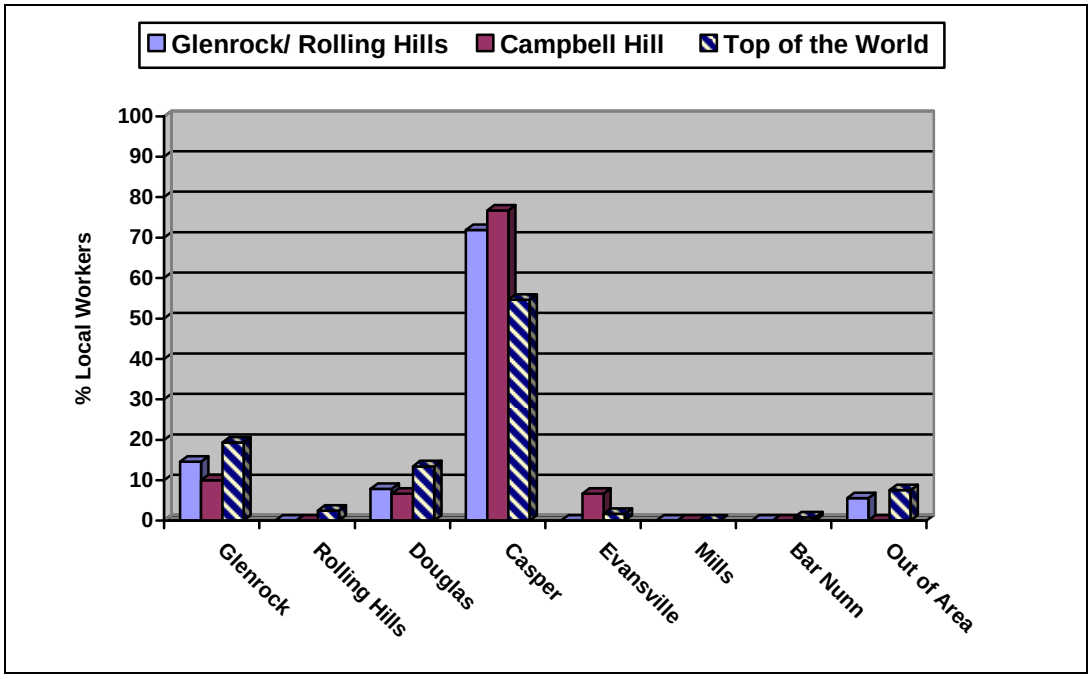


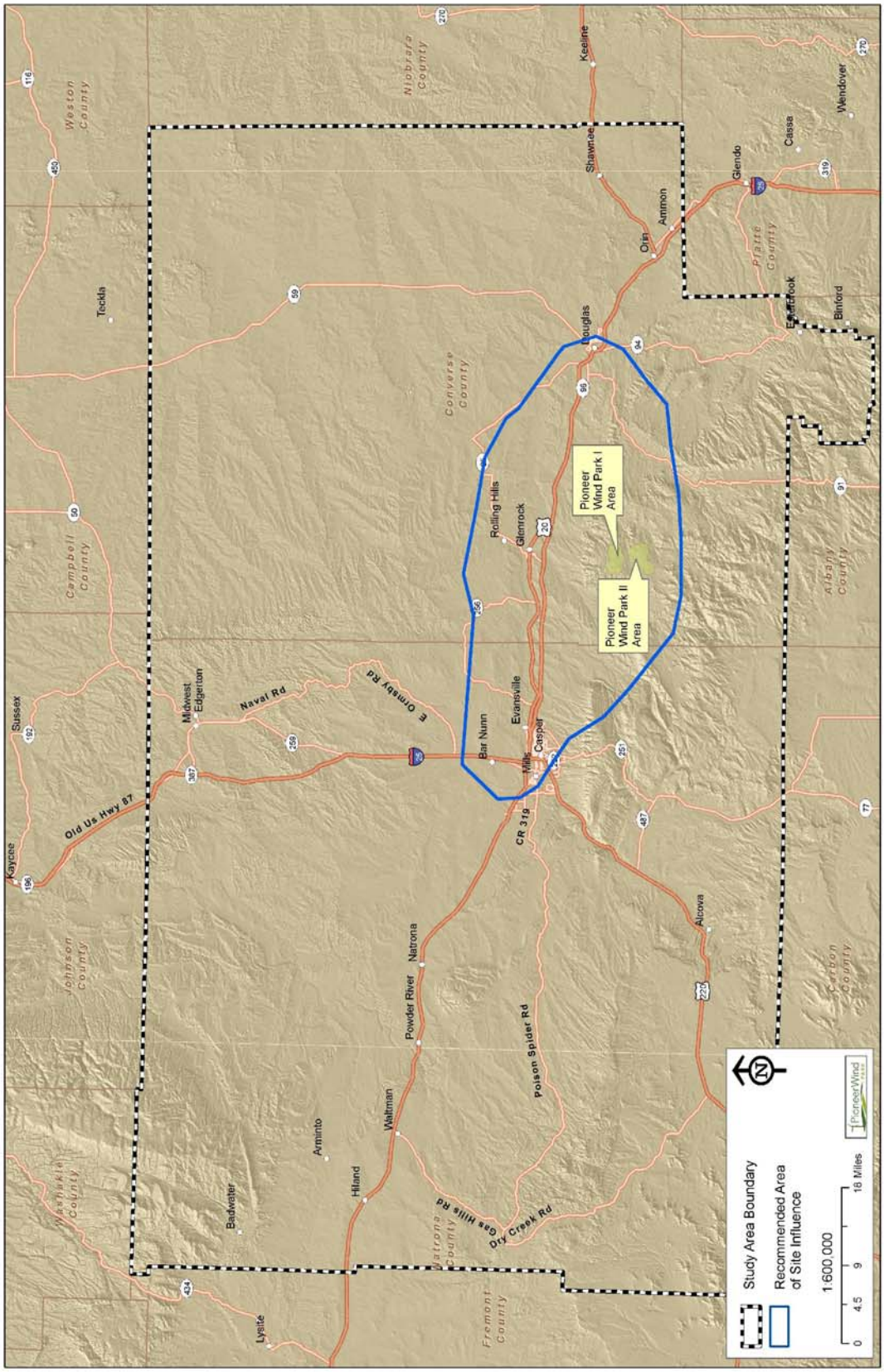
Figure 5-2 Percent Residency by Community of Peak Construction Quarter Locally-Hired Workers: Glenrock Rolling Hills, Campbell Hill & Top of the World Wind Energy Projects. Sources: Wyoming Industrial Siting Division monitoring reports: Rolling Hills/Glenrock, Campbell Hill and Top of the World wind energy projects.

5.1.1.1 Recommended Area of Site Influence and Area Primarily Affected

WWI recommends that the area of site influence for this Application include Converse County and the communities of Glenrock, Douglas and Rolling Hills and Natrona County and the communities of Casper, Evansville, Mills and Bar Nunn (Figure 5-3).

5.2 LOCAL GOVERNMENTS PRIMARILY AFFECTED BY THE PROPOSED PROJECT

Based on the location of the proposed Projects and the recent experience on other Converse County wind energy projects in the Glenrock vicinity, WWI makes the following recommendations regarding the designation of Local Governments Primarily Affected by the Project.


Pioneer Wind Park I Area
Pioneer Wind Park II Area
Study Area Boundary
Recommended Area of Site Influence
1:600,000
0 4.5 9 18 Miles
Keeline
Shawnee
Glendo
Cassa
Wendover
Orin
Ammon
Douglas
Rolling Hills
Glenrock
Evansville
Bar Nunn
Mills
Casper
Midwest
Edgerton
Naval Rd
E Ormsby Rd
Old Us Hwy 87
Kaycee
Sussex
Tecklа
Natrona
Powder River
Poison Spider Rd
Alcova
Waltman
Arminto
Hiland
Badwater
Lysite
Gas Hills Rd
Dry Creek Rd
CR 319
Weston County
Niobrara County
Converse County
Campbell County
Johnson County
Washakie County
Natrona County
Fremont County
Carbon County
Albany County
Platte County
Guernsey
Binford

5.2.1 Recommended Local Governments Primarily Affected by the Proposed Project

WWI recommends that Converse County and the communities of Glenrock, Douglas and Rolling Hills and Natrona County and the communities of Casper, Evansville, Mills and Bar Nunn be designated as Local Governments Primarily Affected by the Proposed Project. All project facilities will be located in Converse County. The communities listed above are the only communities within 60 miles and one hour's commuting time from the PWP I and PWP II project sites, and experience on other Converse County wind energy projects has shown that the vast majority of construction workers reside in these communities.

5.2.1.1 Recommended Exclusions from Areas and Local Governments Primarily Affected by the Proposed Projects

WWI recommends that counties other than Converse and Natrona and communities other than Glenrock, Douglas, Rolling Hills, Casper, Evansville, Mills and Bar Nunn be excluded from the list of Local Governments Primarily Affected by the proposed Projects. WWI recommends that the Converse County community of Lost Springs and the Natrona County communities of Midwest and Edgerton also be excluded based on the distance and commuting time from these counties and communities to the project area and because experience on other Converse County wind energy projects has shown that non-local workers have rarely resided in these counties and communities.

5.2.2 Study Area

The Study Area for the proposed Projects includes Converse and Natrona Counties. This Study Area was identified early in the planning and analysis process in consultation with the ISD. The Study Area includes the recommended Area of Site Influence and the recommended Local Governments Primarily Affected by the project. Casper is the regional trade center for central Wyoming. Although some goods and services may be purchased from Wyoming vendors located outside of the Study Area and a few workers who reside in communities outside the Study Area may commute to work on the project sites, the effects of such purchases and commuting would be beneficial. Adverse socioeconomic and health, safety and welfare effects are not anticipated.

5.3 CONSTRUCTION AND OPERATIONS WORKFORCE ESTIMATES

The number, residence and earnings of the construction employees are important factors in assessing the potential short-term effects to socioeconomic resources in the surrounding communities. Purchases of equipment, material and services by the construction contractors and employees made in the local region are also important factors in determining potential effects.

5.3.1 Construction Workforce Estimates

WWI has estimated the direct construction and operating workforce requirements for the proposed Projects based on the proposed number of WTGs, site access and on-site development, and power collection and interconnection facilities. The total number of construction workers for PWP I is anticipated to range from a peak of 168 workers during August of 2011 to a low of 48 workers during December 2011, and from a peak of 145 workers during August 2012 to a low of 48 workers during December of 2012 for PWP II. The higher peak for PWP I would be associated with construction of off-site access improvements, which would also be used for access to PWP II. PWP I construction activities also include completion of the main electrical substation and the intertie connection to the main transmission line. Table 5-2 below shows the number of workers, by job classification, for the proposed construction schedule.

Average construction employment over the six-month construction period is projected at 96 workers for PWP I and 88 workers for PWP II. The workforce loading schedule, by major activity, is exhibited in Figure 5-4 below. Note that PWP I operations workers are included in the figure starting in December 2011.

5.3.2 Local Hiring and Expected Use of Non-Local Specialized Skilled Workers

Development of the Projects would entail a combination of tasks requiring a variety of skilled construction workers, including cement/concrete finishers, electricians, welders, turbine assembly technicians, heavy equipment operators, mechanics, and truck drivers. A substantial number of general laborers will also be required. The type and timing of the skills will vary during the course of each six-month construction period.

Table 5-2 PWP I and PWP II On-Site Construction Workforce, by Quarter and Job Classification.

	Project I							Project II					
	3rd Quarter 2011			4th Quarter 2011			Jan - Jun 12	3rd Quarter 2012			4th Quarter 2012		
Job Classification	Jul 11	Aug 11	Sep 11	Oct 11	Nov 11	Dec 11		Jul 12	Aug 12	Sep 12	Oct 12	Nov 12	Dec 12
Project Managers	4	7	6	6	5	6	1	4	7	6	6	5	6
Engineer	6	4	0	0	0	0	0	4	4	0	0	0	0
Foreman	2	5	4	4	4	1	0	1	4	4	4	4	1
QA/QC	4	7	7	4	4	4	0	4	7	7	4	4	4
Administrative	1	1	1	1	1	1	0	1	1	1	1	1	1
Safety/Site Security	2	2	2	2	2	2	0	2	2	2	2	2	2
Iron/Steel Workers	6	10	4	2	0	0	0	6	10	4	2	0	0
Cement Masons/ Concrete Finishers	6	6	0	0	0	0	0	6	6	0	0	0	0
WTG Technician Assistants	1	6	6	6	12	15	0	1	6	6	6	12	15
Turbine Technician	0	3	3	2	2	0	0	0	3	3	2	2	0
Electricians	0	15	15	19	19	0	0	0	15	15	19	19	0
Lineman	0	3	3	0	0	0	0	0	3	3	0	0	0
Rigger	0	3	3	2	1	0	0	0	3	3	2	1	0
Plant Operator	2	2	0	0	0	0	0	2	2	0	0	0	0
Equipment Operator	21	31	18	10	9	8	0	16	26	18	10	9	8
Truck Driver	24	30	8	7	7	6	0	14	20	8	7	7	6
Mechanic	3	3	1	1	1	1	0	2	2	1	1	1	1
Laborer	22	30	10	16	16	4	0	16	24	10	16	16	4
Totals	104	168	91	82	83	48	1	79	145	91	82	83	48

Source: WWI.

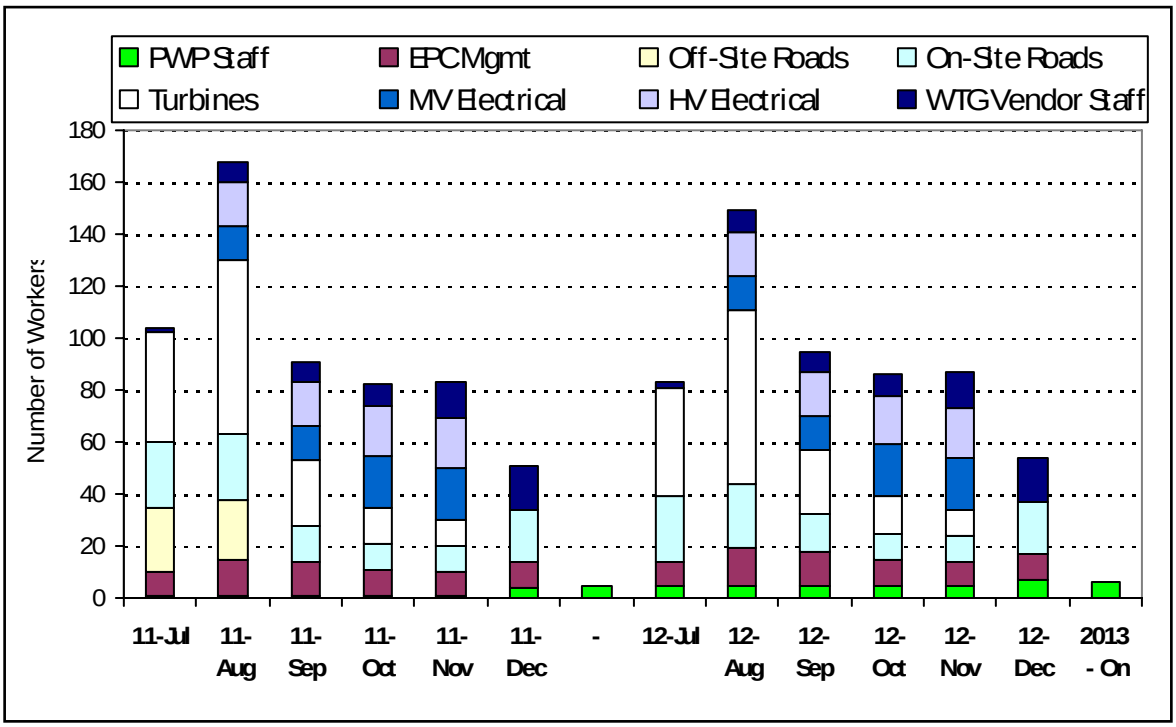


Figure 5-4 Projected On-Site Construction Employment, By Month.

WWI recognizes the value that local contractors and workers can bring to a construction project and understands the importance of supporting nearby communities and economies. Workers with some of the required construction skills are available within the existing Converse and Natrona County labor force, including some workers currently employed by construction contractors that may be selected to perform work on the project. At the same time, the erection, installation and commissioning of WTGs requires specialized skills and contractors that are less common among the local labor force. WTG vendors typically supply their own highly specialized crews for receiving, commissioning and other aspects of WTG installation. Other contractors employing workers with WTG erection and installation skills are likely to be predominately non-local, mobilizing into the local area for the duration of their specific task. Interviews with local Wyoming Department of Workforce Services officials suggest that there is an emerging pool of skilled WTG construction employees in the area as a result of previous wind energy projects (Alley and Dziardziel 2010).

PWP I, LLC and PWP II, LLC will direct its EPC contractor(s) to hire qualified local workers and qualified and cost competitive local contractors. Based on the local hiring achieved by other wind energy projects in the area, as reported in peak quarter monitoring reports filed with the ISD, WWI has

established a local hiring goal for PWP I, LLC and PWP II, LLC of at least 30 percent of the workforce over the course of construction. Local workers and subcontractors are anticipated to account for a higher ratio of workers associated with the construction of off-site access, on-site facility and access, tower foundation and transmission line preparation, with fewer employed for tower erection and commissioning. Figure 5-5 depicts the number of local and non-local workers by month, given the overall local hiring target. As stated in Section 3.4.2, the PWP I, LLC and PWP II, LLC construction EPC contractor(s) and subcontractors will work with the local Wyoming Workforce Services offices in Douglas and Casper to post job openings and hire qualified workers.

PWP I, LLC and PWP II, LLC's targets for local hiring during construction of the Projects, summarized on quarterly basis, are presented in Table 5-3 below.

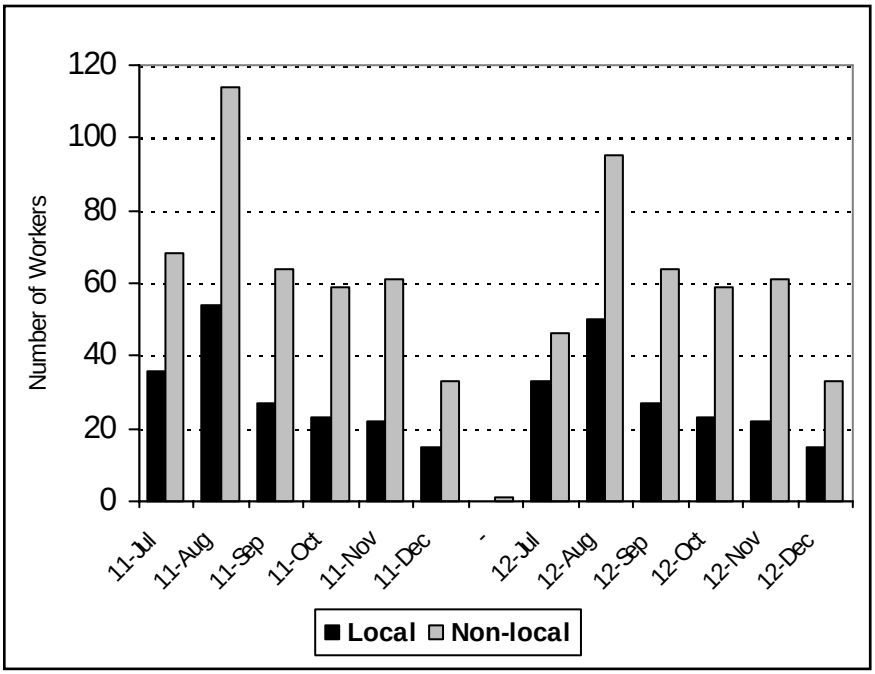


Figure 5-5 Projected On-Site PWPI and PWP II Construction Employment, By Month.

Table 5-3 Resident Status of PWP I and PWP II On-Site Construction Workforce, by Quarter.

	2011		2012			
	3rd quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter
Local Hires (Average)	39	20	0	0	37	20
Non-Local Hires (Average)	82	51	1	1	68	51
Total	121	71	1	1	105	71

5.3.3 Estimated Construction Wages and Benefits

The EPC contractor(s) for PWP I, LLC and PWP II, LLC will provide competitive compensation to all workers employed during the construction phase of the PWP I and PWP II projects. Compensation will include wages, salaries and employer contributions to FICA. EPC contractor employees will have employee health insurance and worker's compensation insurance as well as annual paid holidays, vacation and other benefits. All subcontractors will also be required to provide worker's compensation insurance. Although subcontractors for the Projects have not been selected, it is likely that many employees of subcontractors will receive or be eligible for additional benefits, e.g. contributions to the costs of health insurance, retirement, or paid vacation offered through their employer. The extent of such eligibility cannot be determined at this time. However, based on experience and knowledge of the trends within the industry provided by potential EPC contractors, the estimated value of benefits provided would average about 20 percent of the direct wages and salaries paid to employees.

The average monthly compensation for construction workers employed on the Projects, including the 20 percent allowance for benefits, ranges from $3,600 ($43,200 annually) for general laborers to $10,890 ($130,680 annually) for EPC and PWP I and PWP II on-site project managers. The mean average monthly compensation over the entire construction schedule would be just over $6,000 ($72,000 annually). The total payroll for the project is $6,676,800 - see Table 5-4 below. Payroll costs associated with off-site access and intertie construction would result in approximately $250,000 more in payroll for PWP I than for PWP II.

Non-local EPC and subcontractor workers will receive housing, per diem and travel allowances. Based on the 30 percent local hire target and the duration of on-site activity for the various tasks, an estimated $2,388,240 in such payments would be made during the construction phase of the project, nearly all of

Table 5-4 Estimated Construction Labor Costs, PWP I and PWP II Wind Projects.

Job Classification	Average Monthly Wages / Salary	Total PWP I	Total PWP II	Combined Total
Project Managers	$7,700 to $10,890	$350,480	$350,480	$570,280
Engineer	$6,600	66,000	52,800	118,800
Foreman	$8,400	153,600	140,400	294,000
QA/QC	$5,530	132,720	132,720	265,440
Administrative	$4,630	27,780	27,780	55,560
Safety/Site Security	$3,840 to $5,530	56,220	56,220	112,440
Iron/Steel Workers	$5,280	116,160	116,160	232,320
Cement Masons/ Concrete Finishers	$5,640	67,680	67,680	135,360
WTG Technician Assistants	$5,500 to $6,500	286,000	286,000	572,000
Turbine Technician	$7,680 to $8,160	78,720	78,720	157,440
Electricians	$8,160 to $8,400	559,680	559,680	1,119,360
Lineman	$8,400	50,400	50,400	100,800
Rigger	$5,280	47,520	47,520	95,040
Plant Operator	$6,000	24,000	24,000	48,000
Equipment Operator	$6,000	582,000	522,000	1,104,000
Truck Driver	$5,520	452,640	342,240	794,880
Mechanic	$6,000	60,000	48,000	108,000
Laborer	$3,600	352,800	309,600	662,400
Subtotal Payroll		$3,464,400	$3,212,400	$6,676,800
Per Diem (@ $70/day)		850,500	767,340	1,617,840
Travel (@ $1000/month)		405,000	365,400	770,400
Total Labor Costs		$4,719,900	$4,345,140	$9,065,040

which will be spent on services and lodging in the area of influence during the eighteen months of construction for the two projects. Summing these two components yields total projected labor costs of $9,065,040 during construction.

Compensation paid to construction workers would be more heavily concentrated in the 3rd quarters of each year, the peak quarter being the 3rd quarter of 2011 when workers would collectively earn nearly a third of the total project-related compensation - see Table 5-5 below. Another 28 percent of the total payments to labor would occur in the 3rd quarter of 2012, with the remaining 40 percent being nearly equally split between the 4th quarters of 2011 and 2012.

5.3.4 Operations Workforce Estimates

WWI anticipates a total workforce of six workers during full-scale operations. Hiring of the operating workforce would begin as WTGs are commissioned in the latter stage of PWP I construction. A staff of three or four operations workers would be in place following completion of PWP I at the end of 2011. The ramp-up to full staffing would occur in late 2012/early 2013 as PWP II construction is completed and full-scale generation is achieved. A derivative benefit of the continued growth of wind energy in Wyoming likely includes expanded availability of qualified local labor to staff the operating and maintenance needs of wind energy projects. A local hiring target of 50 percent for the PWP I and PWP II operating workforces would see up to 3 jobs filled from the local labor pool, with a comparable number of new workers brought into the community - see Table 5-6.

Table 5-5 Estimated Construction Labor Compensation, by Quarter, PWP I and PWP II Wind Projects.

	3Q - 2011	4Q - 2011	3Q - 2012	4Q - 2012	Total
Payroll	$2,126,130	$1,338,270	$1,874,130	$1,338,270	$6,676,800
Per Diem	$535,500	$315,000	$458,640	$308,700	$1,617,840
Travel	$255,000	$150,000	$218,400	$147,000	$770,400
Totals	$2,916,630	$1,803,270	$2,551,170	$1,793,970	$9,065,040
Percent of Total	32.2%	19.9%	28.1%	19.8%	100.0%

Table 5-6 Occupational Classification and Residency Status for Operating and Maintenance Staff, Pioneer Wind Park Projects.

	2011		2012				2013			
	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Supervisors	0	1	1	1	1	1	1	1	1	1
Wind Technicians	0	3	3	3	5	5	5	5	5	5
Total	0	4	4	4	6	6	6	6	6	6
Local Hires	0	2	2	2	3	3	3	3	3	3
Non-local Hires	0	2	2	2	3	3	3	3	3	3
Total	0	4	4	4	6	6	6	6	6	6

The permanent on-site staff for PWP I and PWP II would be augmented by administrative and technical personal located off-site. In addition, personnel associated with the WTG manufacturer and other contractors and vendors would be on-site providing scheduled and un-scheduled maintenance on a contract basis. These workers would only be on-site on a temporary basis, i.e., from a matter of hours up to several weeks. The frequency, timing and level of such employment will be based on factors which are unknowable at this time.

5.3.5 Operations Workforce Salaries and Benefits

Based on the prevailing wages and salaries in the industry and the anticipated level of employment, the annual payroll for on-site workers during operations would be approximately $450,000, including the employer-paid FICA, worker's compensation, and contributions to a comprehensive fringe benefit package, including paid vacation, paid holidays, comprehensive medical insurance (including family members), dental insurance, vision care insurance, disability insurance, life insurance, flexible benefit account (medical savings account), disability insurance and a bonus program.

5.4 SOCIAL AND ECONOMIC CONDITIONS: INVENTORY, EVALUATION, AND IMPACT ASSESSMENT

5.4.1 Land Use and Land Use Changes

According to the General Land Use Map for Converse County contained in the Converse County Land Use Plan (LUP) (Converse County 2003), the PWP I and PWP II project sites and surrounding lands lie within the Agricultural category.

The description of the Agricultural Lands category in the LUP is: "Lands, which because of their resource value, e.g. agriculture, non-traditional agriculture use, recreation, and extraction, are encouraged to remain undeveloped."

The LUP Criteria for Allocation of these lands is:

- "Land not suitable for urban development because of slope, soil limitations, hydrologic and geologic hazards,
- Protect areas of important natural resource production and extraction, i.e. agriculture, forestry, recreation and mineral extraction,
- Development of agricultural activity with the usual associated uses should be encouraged with in these areas."

As discussed in the following section, construction and operation of the proposed PWP I and PWP II will not alter the current land use category as agriculture and other current uses of lands within the project areas would continue at the discretion of the individual landowners.

Although some land within the PWP I and PWP II project sites is used for cultivation of hay, grazing and other associated activities (weaning, pregnancy testing, fall shipping, etc.) are the only agricultural uses on private and state lands within the proposed PWP I and PWP II project sites. The proposed PWP I and II project lands are grazed by two ranching operations that have both leased lands to PWP I, LLC and PWP II, LLC for the wind energy projects. Both ranches rotate cattle through the lands in and near the two project areas during the midsummer to mid-fall period as part of their grazing management programs that also involve other lands.

Construction and operations of PWP I and PWP II would affect grazing in two ways. First, construction activity and traffic would require more intensive herd management during active construction seasons. Ranch managers will meet with PWP I, LLC and PWP II, LLC and EPC contractor officials prior to the initiation of construction to review construction locations and activities and determine if they will be able to continue to graze cattle within the PWP I and II project sites or will need to secure alternative pastures during that season. Once the Projects become operational, it is anticipated that grazing activities would be minimally affected by project operations and maintenance activities.

Second, a limited amount of forage - relative to the total amount of possible forage material within the entire area of the two Projects - would be removed from production during construction. During project construction, an estimated 332 acres of forage would be unavailable for production. As construction sites are reclaimed after construction, an estimated 222 acres would be returned to production. Ranchers may be required to manage herds to avoid reclaimed areas until the reseeded forage becomes mature. As noted above, the 110 acres ultimately removed from production is a relatively small area compared to the total 11,864 acres within the two project sites.

The leases between the affected landowners and PWP I, LLC PWP II, LLC include provisions regarding the continued use of lands for grazing purposes, therefore no unmitigated effects on grazing operations are anticipated (DeGraeve 2010, Grant 2010).

Development of PWP I and PWP II would generate an additional income stream for the ranching operations on which the WTGs would be located and for landowners of other lands leased to PWP I, LLC and PWP II, LLC. Given the current project configuration, the Wyoming State Land Board would be included among these landowners if the state lands lease is obtained.

The income streams associated with wind energy project leases typically include an initial payment and recurrent annual rents and/or fees. Some owners of leased lands would receive a basic fixed sum, often with adjustments for inflation, others would receive amounts tied to the installed generated capacity and quantity of electricity generated. Terms of individual leases are confidential, however, WWI anticipates that at full production payments to all lessors would exceed $1.0 million annually from the two Projects.

A potential beneficial effect on agriculture production associated with development and operations of the two Projects is that landowners who have lands leased both within the proposed PWP I and PWP II project sites and adjacent lands would receive income that would not be dependent on livestock markets, feed and fuel costs or weather conditions. This additional income stream would allow the affected ranchers more economic flexibility in improving ranch operations and in some cases, continuing the lands' use for agricultural purposes.

Construction traffic has the potential to affect grazing operations in open range areas along access routes to the PWP I and II project sites. Effects could include damage to grazing improvements such as cattle guards and fences, livestock injury or mortality associated with vehicle/livestock collisions and reduced

palatability of forage along roadways due to dust. Most of the land on either side of the Mormon Canyon Road access route is owned by individuals who have leased land to PWPLLC, PWP I, LLC or PWP II, LLC. These landowners have provisions in their leases to account for any effects on grazing improvements and livestock mortality or injury. The EPC contractor will be required to manage dust on area roadways and control noxious weeds in and around disturbed areas, which should minimize effects on adjacent forage.

5.4.2 Area Economic Study

5.4.2.1 Impact Analysis Methodology

The primary drivers of potential socioeconomic effects associated with construction and operation of the proposed PWP I and PWP II would be the direct construction and operating employment, associated payroll, level of capital investment, lease revenues paid to landowners and the one-time and recurrent public sector revenues generated by the projects. These factors will support additional indirect and induced effects in the regional economy, through what is commonly referred to as the “multiplier effect”. Construction-related effects will be temporary and short-term in nature reflecting the duration of the schedule, and the number, short-term peaking, and turnover in the construction work force as the various phases of construction are completed. Long-term effects related to operations will be driven by the size of the direct work force and the continuing direct and indirect fiscal contributions of the projects. These effects are detailed in the sections below.

5.4.2.2 Regional Economic Analysis

The construction and operation of two new wind energy facilities would represent a new economic infusion into the local economy. In economic terms, this infusion and the direct construction and operations jobs associated with the Projects are considered “basic” jobs that would be part of the economic foundation or “base” of the regional economy. Supply linkages between different sectors of the economy allow some local businesses to meet some of the needs associated with the facilities, as well as the consumer needs associated with workers directly employed by the projects and those of vendors in the supply chain, thereby leveraging the initial infusion into additional jobs and income. The recirculation continues but at a diminished level as leakage occurs, leakage being the outflow of money attributable to the purchases of non-local goods and services, outflow of business profits and state and federal taxes,

until the incremental impact effectively disappears. Much of the secondary indirect and induced economic activity and jobs are in the trade, service, and financial sectors, but all sectors are affected. Such leveraging also encompasses the public sector as one-time and recurrent revenues support public sector employment and operations. Depending on the scale and capacity of existing public sector operations, the economic stimulus associated with two new projects may not result in increases in jobs or expenditures, but rather, may reduce the tax burden/cost on other taxpayers. The net effect of this savings is to increase disposable income available to them, which contributes to the overall multiplier effect. Collectively, the secondary effects are considered "non-basic" jobs, contingent upon the "basic" jobs for their economic support.

Economists use mathematical analysis to capture and describe the supply and demand linkages between the economic sectors, which, given an estimate of the direct economic infusion, yield estimates of the total effects expressed in terms of jobs, income, and overall economic output. Additional analysis can yield estimates of the incremental public sector revenue generated.

This assessment relies on the IMPLAN regional economic modeling software, calibrated with economic data for Wyoming, to estimate the total employment and income effects associated with the proposed PWP I and PWP II projects. The total employment impact, including the indirect and induced effects, feed into the assessment of impacts on housing and public facilities and services. IMPLAN was originally developed by the U.S. Forest Service to guide land management decisions, subsequently commercialized, and is now widely accepted in regional economic and economic impact assessment circles. Both a standalone version of IMPLAN and the Jobs and Economic Development Impact (JEDI) software application developed by the National Renewable Energy Laboratory (NREL) specifically to examine some of the economic effects of wind energy development were used for this analysis.

5.4.2.3 Existing Conditions

Employment and Unemployment

Prior to the current economic downturn, Converse and Natrona counties had experienced two decades of nearly uninterrupted economic stability and growth. Between 1988 and 2008, total employment in Converse County increased by nearly 2,200 jobs (35%). The net gains in Natrona County amounted to more than 18,400 jobs (49%). Those gains came on the heels of economic contractions in the early1980s

tied to the energy crisis and its effect on energy resource production and the completion of much of the mining and power generation infrastructure that remains in place and continues to produce across the state. Casper had emerged as a major service center supporting that development and thus experienced a major loss of jobs. Only in 2007 did total employment in Natrona County top the previous peak employment of 51,044 recorded in 1981 - Figure 5-6 displays total employment trends for the period 1970 to 2009. Converse County experienced similar economic distress, although job losses were smaller in absolute and relative magnitude than those in neighboring Natrona County.

The ongoing economic downturn, the localized manifestations of which began materializing in 2008, slowed the pace of economic growth in Converse County and resulted in economic contraction in Natrona County. Available economic data for 2009 and early 2010 indicate a slight increase in the total number of jobs in Converse County as compared to 2008 levels, which was perhaps tied to the construction of the three existing wind energy projects now operating in the region, but a loss of 2,000 to 3,000 jobs in Natrona County during the same period.

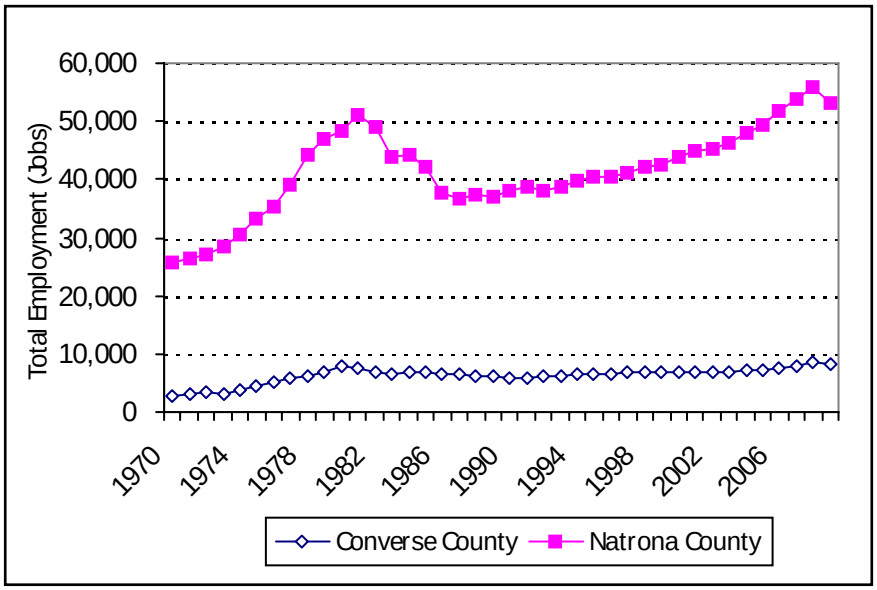


Figure 5-6 Total Full and Part Time Employment in Converse and Natrona Counties, 1970 to 2009. Sources: U.S. Department of Commerce, Bureau of Economic Analysis, 2010 and Wyoming Department of Employment, Research and Planning, 2010a.

For several years, the favorable economic climate helped local unemployment trend steadily downwards, eventually hitting record low levels near the end of 2007 – see Figure 5-7 below. Unemployment

remained low throughout much of 2008, but then climbed rapidly as the economic downturn took hold. By the beginning of 2010, unemployment rates topped 7 percent in Converse County and reached 9.0 percent in Natrona County, slightly higher than the statewide average. The number of unemployed in Natrona County climbed from about 1,100 in October 2008 to 3,559 in January 2010. The corresponding metrics for Converse County are 201 and 547 unemployed.

Unemployment has eased since the beginning of 2010, but the reasons for the improvement appear to differ between Converse and Natrona County. The number of residents in the Converse County labor force and number employed have both increased, while the number of unemployed declined slightly. As a result of these trends, unemployment in Converse County is approaching 5.0 percent.

Unemployment has also declined in Natrona County. As in Converse County, the number of employed has risen, but the available data suggest that a decline in the number of people actively looking for work has contributed to the decline in unemployment. Whether that pattern reflects frustration or people who had previously been induced to (re)join the labor force by the favorable job market again exiting the labor force, or some other reason, is not known. Table 5-7 and Figure 5-8 below summarize these trends in the local labor market.

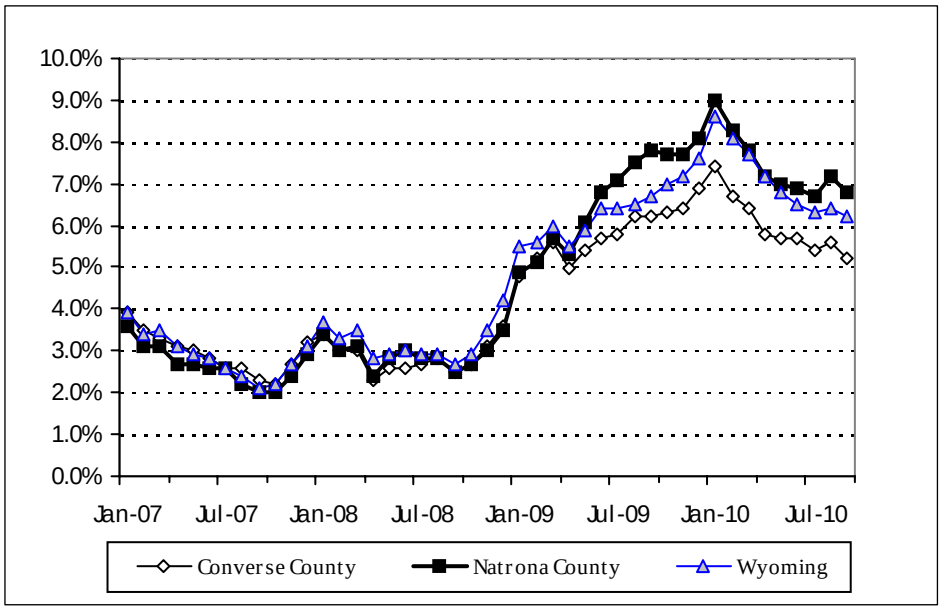


Figure 5-7 Monthly Unemployment Rates, Wyoming and Natrona and Converse Counties, (2007-2010). Source: U.S. Department of Labor, Bureau of Labor Statistics, 2010a.

Table 5-7 Labor Market Summary, 2004 to 2010.

	2004	2005	2006	2007	2008	2009	2010

							(Aug)
Converse County							
Labor Force	6,499	6,714	6,897	6,987	7,358	7,438	7,576
Employment	6,235	6,459	6,656	6,783	7,148	7,006	7,154
Unemployment	264	255	241	204	210	432	422
Unemployment Rate	4.1%	3.8%	3.5%	2.9%	2.9%	5.8%	5.6%
Natrona County							
Labor Force	38,651	39,354	40,294	40,488	40,762	40,419	40,395
Employment	37,197	37,961	39,068	39,411	39,576	37,735	37,500
Unemployment	1,454	1,393	1,226	1,077	1,186	2,684	2,895
Unemployment Rate	3.8%	3.5%	3.0%	2.7%	2.9%	6.6%	7.2%

Source: U.S. Department of Labor, Bureau of Labor Statistics, 2010a

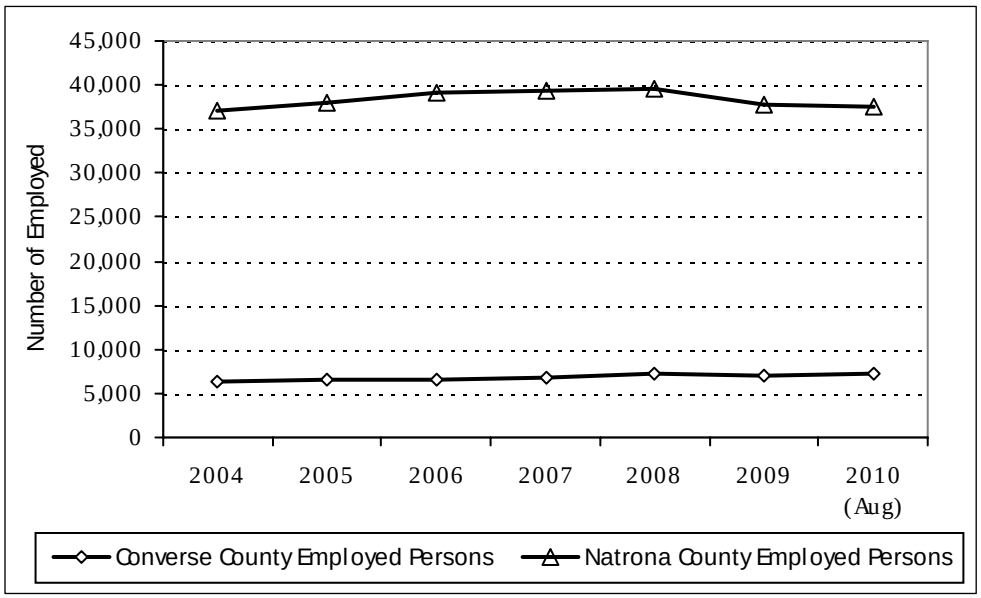


Figure 5-8 Number of Employed Residents for Converse and Natrona Counties, (2004-2010). Source: U.S. Department of Labor, Bureau of Labor Statistics, 2010a.

Economic Base

Wyoming's economy is fundamentally natural resource-based. Agriculture, big game, furbearers and coal were initially the key commodities. Over time, the extraction of other minerals and carbon-based commodities increased in importance, as well as tourism and outdoor recreation, which are also dependent on natural resources. That dependency on the extraction of natural resources brings with it a susceptibility to periodic expansion and contraction cycles associated with technological advances, changes in markets, and other factors. The Converse and Natrona county economies reflect that heritage.

Agriculture remains an important contributor to the Converse County's economy, accounting for more than six percent of all jobs in the county in 2008, double the statewide average. Private sector employment of 6,474 jobs in 2008, accounted for nearly 77 percent of all jobs, slightly lower than the statewide average. Public sector employment accounted for just over one of every six jobs in the County - see Table 5-8. The mining industry, anchored by coal mining but also including the oil and gas industry, accounted for 13 percent of all full-time and part-time jobs in the county. Other important sectors and their respective shares of total employment were construction (9 percent), retail trade (9 percent), and arts, entertainment, leisure and hospitality (9 percent).

Table 5-8 Comparative Employment Characteristics for 2008: Statewide and Converse and Natrona Counties.

	Converse County		Natrona County		Wyoming
	Total Full- and Part-time Employment	Percent of the Total	Total Full- and Part-time Employment	Percent of the Total	Percent of the Total
Farm	524	6%	490	1%	3%
Private	6,474	77%	49,281	88%	79%
Government	1,456	17%	6,151	11%	18%
Total	8,454	100%	55,922	100%	100%
In Selected Industrial Sectors					
Mining	1,091	13%	5,610	10%	6%
Construction	996	12%	4,484	8%	10%
Retail Trade	761	9%	6,632	12%	10%
Arts, entertainment, leisure and hospitality	715	9%	4,897	9%	10%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, 2010a.

Not apparent in the county-level data is the difference in underlying economic structure of Glenrock as compared to that of the Douglas area. The Dave Johnston Power Plant, wind energy and oil and gas development are key elements of the local economic base of Glenrock. Retail trade and consumer-oriented services are also important, but the variety and size of businesses reflects consumer leakage to Casper. Douglas's economy relies more heavily on coal mining in northern portion of the county and neighboring Campbell County, as well as on transportation and federal and state employment.

Agriculture directly accounts for only one percent of the employment in Natrona County, although the share would increase if agricultural support activities were factored in. Private sector employers provided nearly 49,300 jobs in 2008 (88 percent), with the public sector accounting for the remaining 11 percent. The ratio of private sector employment is considerably above the statewide average, while public sector employment as a share of total employment is below the statewide average. Like its neighbor, the mining industry is a major employer in Natrona County, although more so in the form of ancillary and service support establishments. Casper's role as a trade and service center is reflected in the higher shares of jobs in retail trade and total of nearly 4,900 jobs in the arts, entertainment, leisure and hospitality industries.

Much of the long-term gains in employment over the last two decades occurred in recent years, with a net gain of 1,569 jobs reported in Converse County between 2001 and 2008. Figure 5-9 below illustrates theses changes. Increases occurred across a broad spectrum of industries, but increases in mining and construction employment together accounted for nearly half of the increase.

A net gain of 10,982 jobs occurred in Natrona County between 2001 and 2008. As in Converse County, net gains were recorded across most industries, with mining and construction employment being major contributors to the overall increase. Together those two industries accounted for one-third of the net job gains. In addition, substantial gains occurred in real estate development, health care and social services, and the lodging and food service industries - see Figure 5-10 below.

The economic downturn resulted in effects at the local level that altered the long-term trend of economic growth that had been present in the region, although the underlying core structure of the region's economic base has not changed dramatically. The changes are highlighted in Figures 5-11 and 5-12 below, using comparative employment data for the 1st quarters of 2008, 2009, and 2010. Total employment in Converse County declined slightly from 2008 to 2009, primarily due to drops in construction and transportation and warehousing employment. Mining employment actually increased slightly. Additional gains in the mining, government, construction industries between 2009 and 2010 resulted in a year-over-year gain of nearly 3 percent.

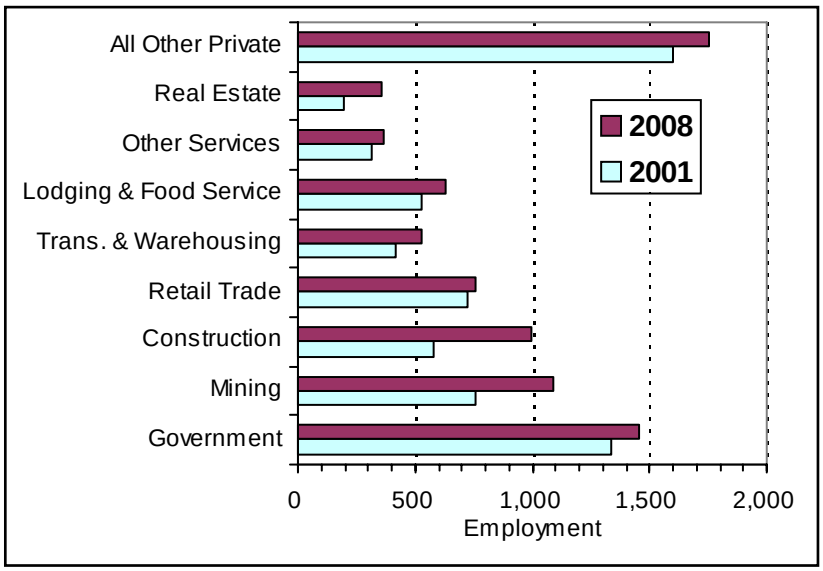


Figure 5-9 Changes in Employment by Industry for Converse County, (2001-2008). Source: U.S. Department of Labor, Bureau of Economic Analysis, 2010b.

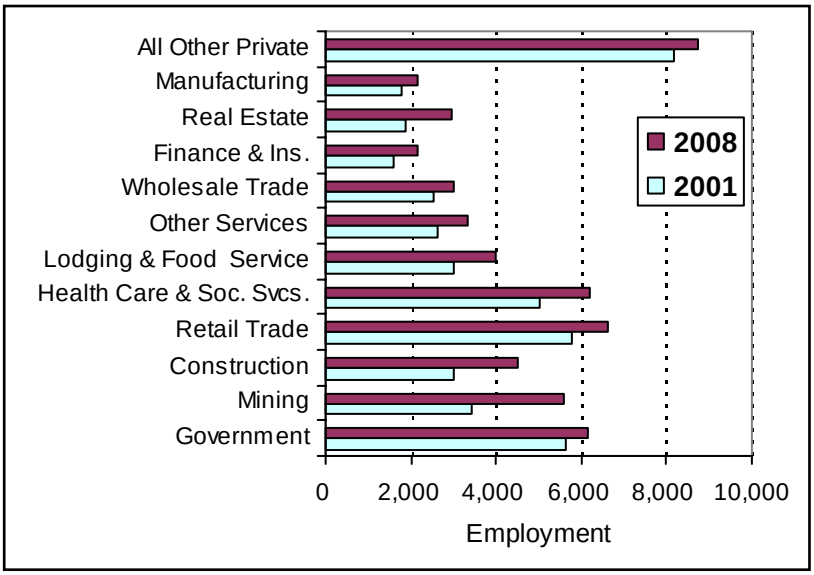


Figure 5-10 Changes in Employment by Industry for Natrona County, (2001-2008).). Source: U.S. Department of Labor, Bureau of Economic Analysis, 2010b.

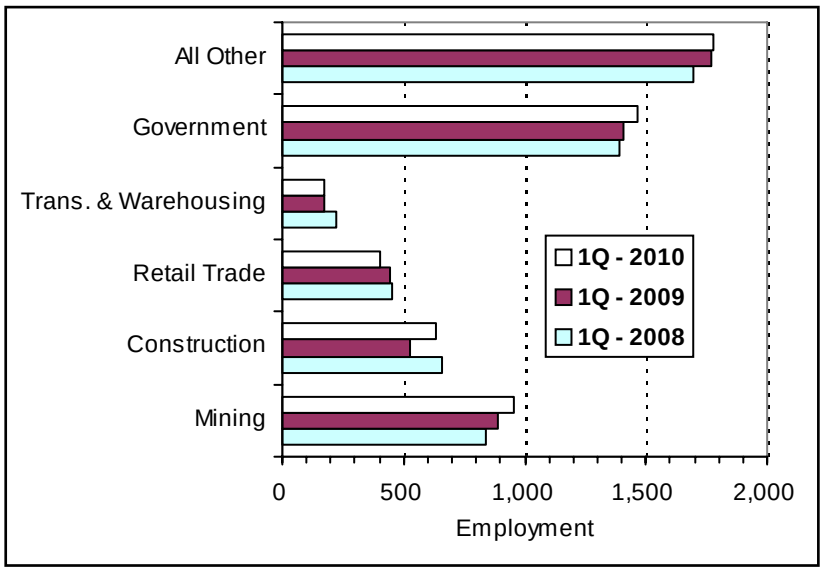


Figure 5-11 Changes in 1st Quarter Employment in Converse County, 2008-2010. Source: Wyoming Department of Employment, Research and Planning, 2010a.

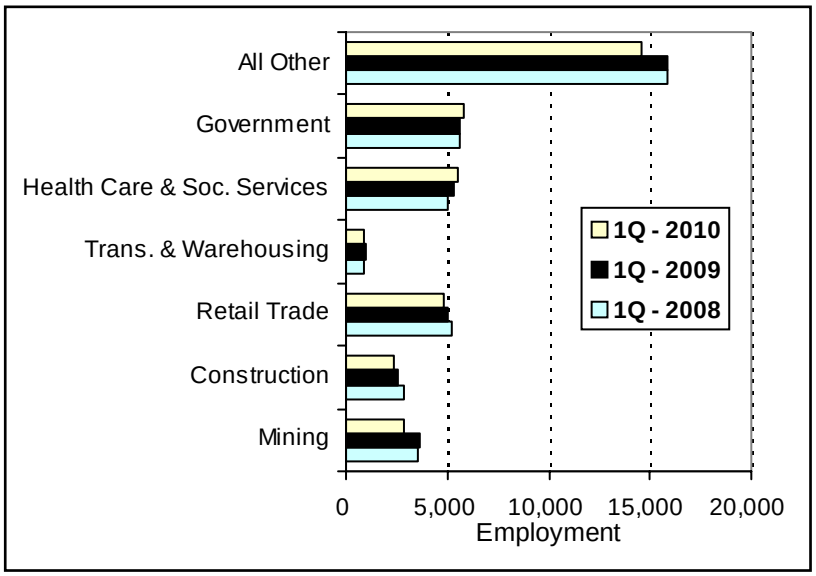


Figure 5-12 Changes in Employment in Natrona County, (2001-2008). Source: Wyoming Department of Employment, Research and Planning, 2010a.

Losses in mining and construction sector employment were the primary changes in the Natrona County economic during this period - see Figure 5-12 below. Job losses were also registered in the manufacturing, wholesale trade and retail trade sectors. Gains in public sector and health care and social services employment offset some of those declines, but the net loss of more than 2,000 resulted. As in Converse County, net gains were recorded across most industries, with mining and construction employment being major contributors to the overall increase. Together those two industries accounted for one-third of the net gain. In addition, substantial gains also occurred in real estate development, health care and social services, and the lodging and food service industries - see Figure 5-12 below.

The ten largest employers, in terms of number of employees, presented in Table 5-9 below, reflect the significance of energy, health care, and public sector establishments in the local economy.

Table 5-9 Major Employers, Converse and Natrona Counties.

Enterprise (Ranked)	Number of Employees	Product or Service
Converse County		
1. Powder River Coal, North Rochelle Mine	375	Mining
2. Converse County School District	300	Education
3. Kennecott Energy, Antelope Coal Mine	291	Mining
4. Memorial Hospital of Converse County	247	Health Care
5. Union Pacific Railroad	200	Railroad
6. Dave Johnston Power Plant	196	Power Plant
7. Converse County	100	County Government
8. Power Resources, Uranium Mine	79	Mining
9. City of Douglas	63	City Government
10. Safeway	55	Retail
Natrona County		
1. Natrona County School District No. 1	1,427	Education
2. Wyoming Medical Center	946	Health Care
3. Key Energy	620	Energy Production
4. TIC (The Industrial Company)	600	Industrial Builders
5. City of Casper	507	City Government
6. Wal-Mart	386	Retail
7. JW Williams	357	Oil & Gas Engineering
8. Office Max	339	Call Center
9. Casper College	331	Education
10. Wyoming Machinery Company	315	Caterpillar Dealer

Sources: Wyoming Business Council, 2010a, 2010b.

Construction Labor

The construction industry was among the primary drivers and beneficiaries of the extended economic expansion in the region prior to mid-2008. Natrona County in particular benefited, as construction employment added more than 1,000 new jobs between 2001 and 2008. Gains occurred in all three major subcategories of construction employment: construction of buildings, heavy and civil construction, and specialty contractors. In Converse County, construction sector employment was relatively stable from 2001 through 2006, but then increased. In part, the increase was due to wind energy related construction.

The economic downturn triggered a slowdown in local construction activity, resulting in a net loss of approximately 400 jobs in Natrona County during 2009 - see Figure 5-13 below. In Converse County construction sector employment actually increased during the middle portion of 2009, but has since declined, although it remains above the pre-2007 levels. Preliminary data for early/mid 2010 suggest further declines in construction employment in Natrona County. The more recent trends in construction employment are evident in the monthly employment data shown in Figure 5-14.

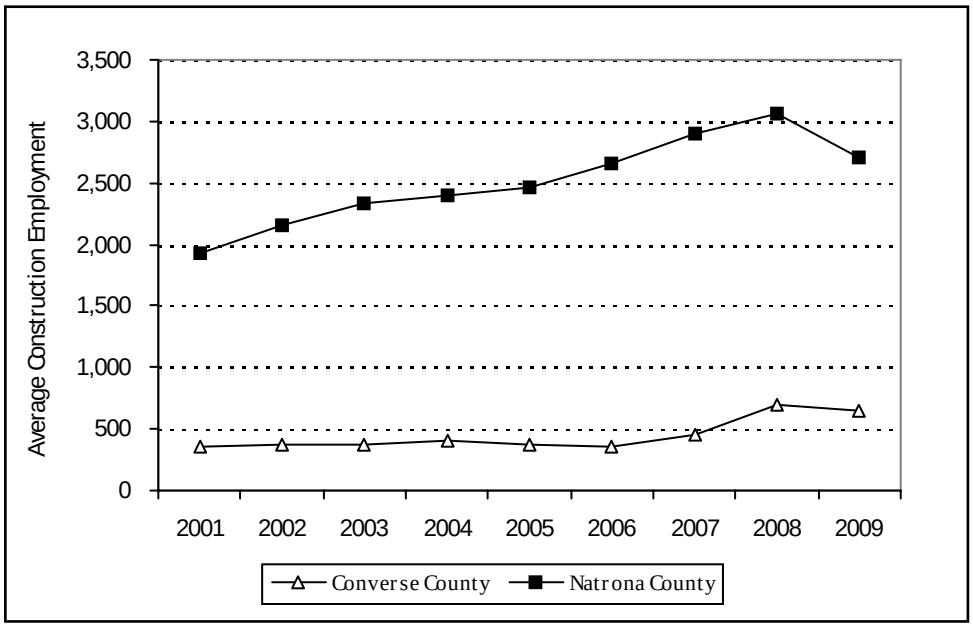


Figure 5-13 Construction Employment Trends in Converse and Natrona Counties, 2001 to 2009.
Source: Source: Wyoming Department of Employment, Research and Planning, 2010a.

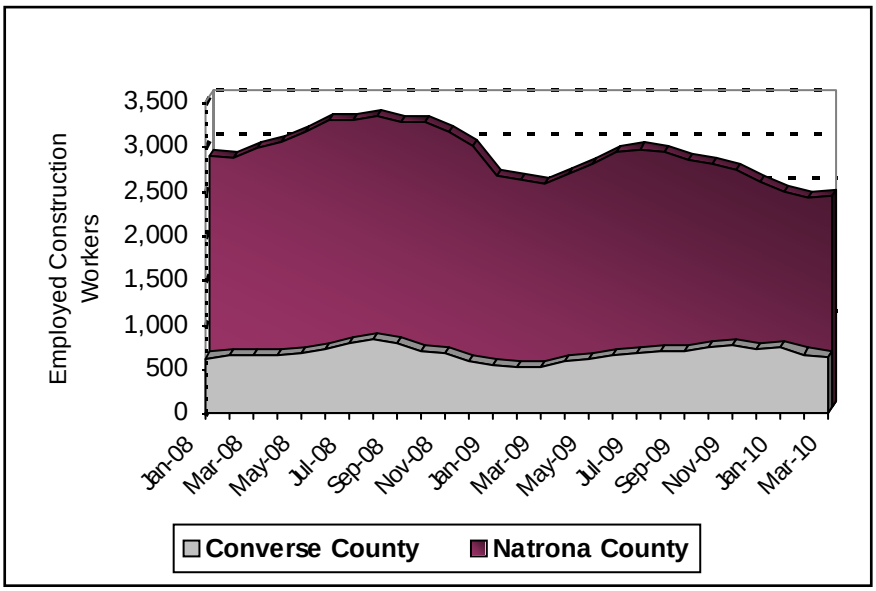


Figure 5-14 Monthly Construction Employment in Converse and Natrona Counties, (2008 - 2010). Source: Wyoming Department of Employment, Research and Planning, 2010a.

Personal Income

Personal income, both in aggregate and on a per capita basis, is another measure of local economic growth and performance. On an aggregate basis, personal income in both counties has increased over time due to a combination of employment and population growth, inflation, and increases in non-labor income, such as dividends. In Converse County, total personal income increased from $53 million to $589.6 million between 1975 and 2008, more than an 11-fold increase. Income growth since 2000 averaged 8 percent per year on a compounded basis. Total personal income in Natrona County increased by nearly 8-fold during the same period, reaching $3.8 billion in 2008 and registering average annual growth of 6.5 percent since 2000. Figure 5-15 below shows total personal income for the period 1975 through 2008.

Per capita personal income is a common measure of economic welfare of local residents, with changes in inflation-adjusted per capita income providing an indication of general welfare changes over time. In general, residents of the two counties have experienced long-term improvement in overall economic welfare, with particularly strong gains since 1996 - see Figure 5-16 below. Between 1996 and 2008, inflation adjusted per capita income rose by 61 percent in Converse County and 55 percent in Natrona County.

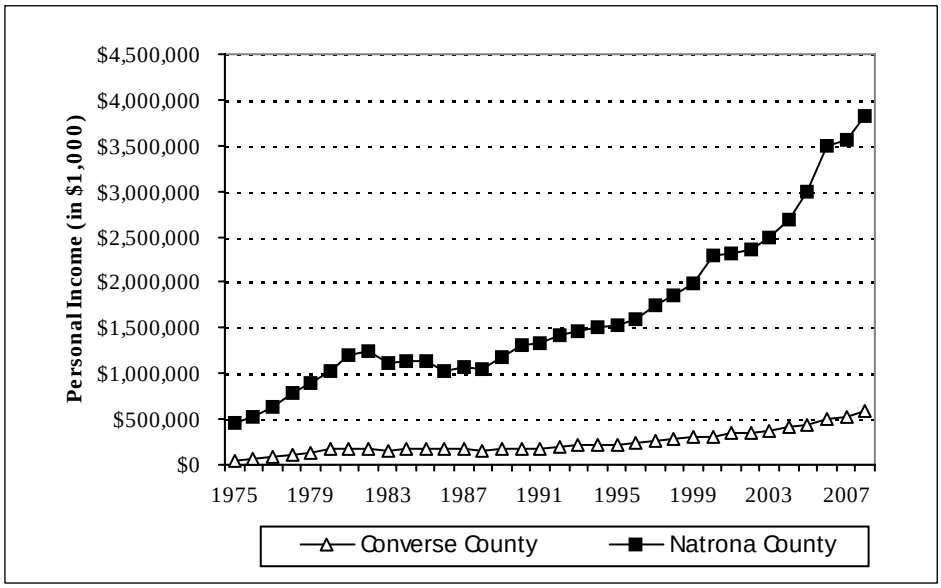


Figure 5-15 Aggregate Personal Income by County (1975-2008). Source: U.S. Department of Commerce, Bureau of Economic Analysis 2010a.

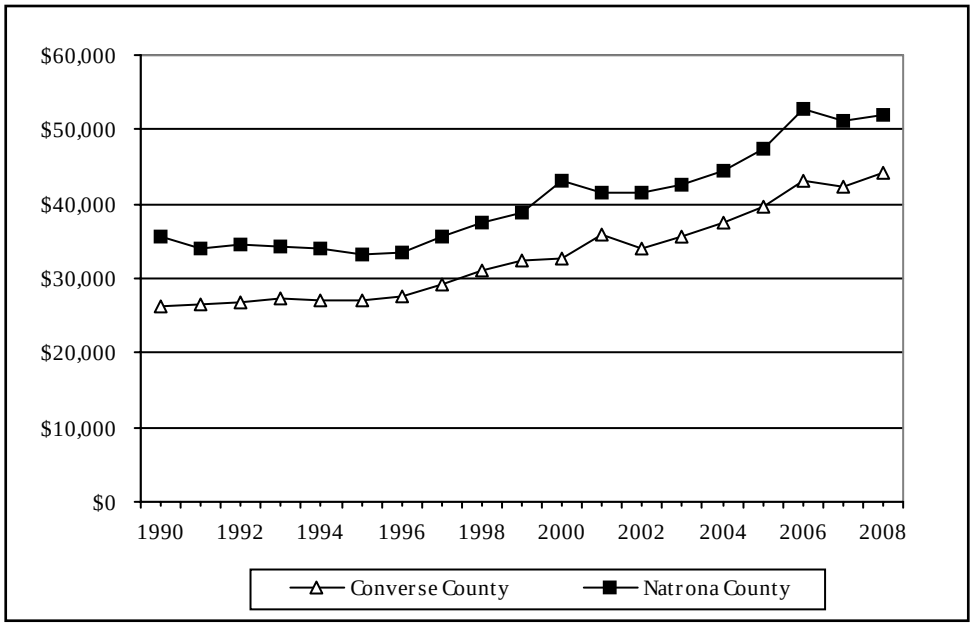


Figure 5-16 Per Capita Personal Income by County (1990-2008) in Real Dollars (2009 Dollars). Note: Adjusted to 2009 dollars, based upon CPI referenced below. Sources: U.S. Department of Commerce, Bureau of Economic Analysis, 2010a; Bureau of Labor Statistics, 2010b.

Despite the gains in Converse County, real per capita income lags that in Natrona County, $44,291 compared to $51,989 in 2008, continuing a long-standing trend. As a result of the recent gains, per capita income in Converse County in 2008 was about 92 percent of the statewide average, narrowing the gap from 88 percent in 1990 - see Figure 5-17 below. Per capita income in Natrona County in 2008 was about 107 percent of the statewide average, again a long-established pattern, although the margin has become smaller over time due to the gains elsewhere in the state, particularly Teton, Sublette, and Campbell counties. In 2008, Natrona County ranked 4th and Converse County ranked 10th among Wyoming's counties in terms of per capita income.

Earnings paid to workers is the primary, but not sole component of local personal income. Work force commuting can play an important role in local economies as the earnings that flow into or from an economy in conjunction with such commuting help establish the levels of retail trade, personal services and public services demanded and supported. Because it is typical for some level of commuting between adjacent counties to occur, commuting income is reported on a net basis. Non-labor earnings, for example, income derived from dividends, are the other major component of income. Non-labor earnings have attracted much attention in recent years for their association with retirees and second-home owners and the economic development potential those two groups represent. Table 5-10 below summarizes the composition of total income, by major source, for 2008.

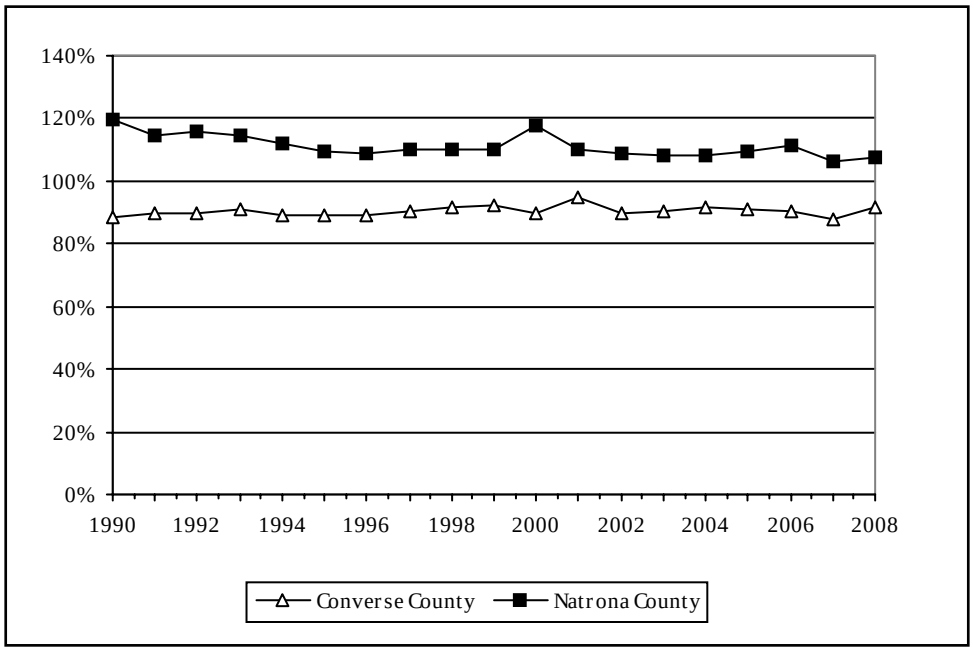


Figure 5-17 Per Capita Personal Income as Proportion of the Statewide Average, (1990-2008). Source: U.S. Department of Commerce, Bureau of Economic Analysis, 2010b.

Table 5-10 Composition of Total Personal Income, 2008.

	Converse County		Natrona County	
	($ Millions)	Percent Of Total	($ Millions)	Percent Of Total
Earnings By Place of Work	$384.6	65.2%	$2,903.8	76.2%
Less: Contributions for Government Social Insurance	-50.6	-8.6%	-332.5	-8.7%
Plus: Net Residency Adjustment	76.4	13.0%	-2.4	-0.1%
Net Earnings by Place of Residence	$410.4	69.6%	$2,568.9	67.4%
Plus; Dividends, Interest and rent	107.7	18.3%	829.8	21.8%
Plus: Personal Current Transfers	71.5	12.1%	413.8	10.9%
Equals: Total Personal Income	$589.6	100.0%	$3,812.5	100.0%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, 2010a.

Earnings by place of work, before deductions for mandatory contributions to government social security, totaled $384.6 million in Converse County in 2008. The net residency adjustment for commuting added another $76.4 million, equivalent to 13 percent of the total personal income in the county. Data from the Wyoming Department of Employment indicate substantial levels of commuting by Converse County residents to both Campbell County (mining) and Natrona County (various industries). Non-labor income contributed $179.2 million, more than 30 percent of the total.

In 2008, earnings by place of work, before deductions for mandatory contributions to government social security, totaled $2.9 billion in Natrona County. In contrast to the net residency inflow recorded in Converse County, a small net residency outflow of $2.4 million occurred in Natrona County. Some of that outflow was to other Wyoming counties, but outflows to other states also occurred. Non-labor income was a major source of income for Natrona County residents, contributing more than $1.2 billion in 2008, nearly $1-of-every-$3 in personal income.

Agriculture is a traditional part of the region's economic base. The 2007 national census of agriculture tallied 435 farms and ranches, operating more than 2.3 million acres of land in Converse County. In Natrona County the corresponding numbers were 413 farms and ranches and nearly 2.2 million acres of land. Agriculture is the predominant land use within the PWP I and PWP II project sites. Despite the

many farms and ranches, economic realities pose challenges to continued agriculture operations. In 2007 and 2008, annual cash receipts, other income of approximately $30 to $35 million in each county, and net realized income were negative - see Table 5-11 below. Allowing for adjustments for corporate operations, changes in inventory value, and other factors, resulted in net losses in farm labor and proprietors' income in both counties in 2007 and in Natrona County in 2008. Net farm income in Converse County was a modest $600,000 in 2008.

5.4.2.4 Future Economic Conditions

The current economic downturn brought to a halt nearly two decades of economic expansion in Wyoming, expansion in which Converse and Natrona County had both participated. Prior to the downturn, continuing mineral and energy resource development, including efforts to develop wind and other renewable and "clean" energy resources, were expected to be an important driver of future growth. Employment projections released by the Wyoming Economic Analysis Division (WEAD) in 2007 projected the addition of 59,250 net new jobs between 2006 and 2016, a 17 percent increase. Population growth of comparable proportion was portrayed in demographic projections released by the WEAD in 2008, wherein statewide population was projected to exceed 621,100 in 2030, a net gain of more than 92,000 residents (15 percent) as compared to 2010. As of November 2010, WEAD has not released updated projections reflecting a renewed look at long-term prospects for economic and population growth, beginning with questions regarding the timing and strength of the economic recovery.

Table 5-11 Farm Income and Expenses ($ Millions), 2007 and 2008.

	Converse County		Natrona County	
	2007	2008	2007	2008
Total cash receipts and other income	$35.7	$33.6	$35.0	$29.1
Less: Total production expenses	$41.0	$42.1	$40.2	$41.2
Equals: Realized Net Income	($5.30)	($8.50)	($5.20)	($12.10)
Less: Net adjustment for corporate farm income, inventory change, farm wages and other	($4.30)	($9.10)	($4.70)	($10.30)
Plus: Total farm labor and proprietors' income	($1.00)	$0.60	($0.50)	($1.80)

Source: U.S. Department of Commerce, Bureau of Economic Analysis, 2010c.

Comparing current and previous long-term occupational employment projections released by the Wyoming Department of Employment provides a perspective on the potential implications of the economic downturn for future growth. Long-term occupational projections covering the period 2006 to 2016, released two years ago, foresaw employment climbing at nearly 2 percent per year to reach 321,836 in 2016. Recently released projections, summarized in Table 5-12 are more conservative anticipating a gain in employment of 25,733, to 312,050 over the 10-year period 2008 to 2018 - see Table 5-12. The net gains represent an average annual growth of 0.9 percent. The largest gains, in absolute terms, are projected to occur in the health care and social services, educational services, arts, entertainment, leisure and hospitality, and professional and business services industries. Manufacturing employment, and that in the natural resources and mining industries, are expected to decline over the upcoming decade.

Table 5-12 Long Term Employment Projections, By Industry, 2008-2018.

			Change 2008-2018	
	2008 Employment	2018 Employment	Absolute	Average Annual Growth
Natural Resources & Mining	31,696	31,523	-173	-0.10 %
Construction	28,184	30,408	2,224	0.80 %
Manufacturing	10,056	9,638	-418	-0.40 %
Wholesale Trade	9,110	9,300	190	0.20 %
Retail Trade	32,312	33,751	1,439	0.40 %
Transportation, Warehousing & Utilities	12,335	13,097	762	0.60 %
Information	4,699	4,782	83	0.20 %
Financial Activities	11,727	12,761	1,034	0.80 %
Professional & Business Services	18,871	21,851	2,980	1.50 %
Educational Services	26,313	30,344	4,031	1.40 %
Health Care and Social Services	31,372	38,926	7,554	2.20 %
Arts, Entertainment, Leisure & Hospitality	36,061	39,090	3,029	0.80 %
Other Services	8,805	9,560	755	0.80 %
Government (Including Postal Services)	24,777	27,019	2,242	0.90 %
Total, All Industries	286,317	312,050	25,733	0.90 %

Source: Wyoming Department of Employment. 2010b.

5.2.4.5 Project Impacts on Total Employment

As described above, in addition to the direct, or basic, jobs associated with construction and operation of PWP I and II, the projects would also support a number of indirect and induced jobs, i.e., non-basic jobs, in the region. Based on economic data for Wyoming and the construction of wind energy projects, the estimated total numbers of induced jobs are 48 during construction of PWP I and 40 during construction of PWP II - see Table 5-13 below. These estimates reflect an overall job multiplier of 0.4 during construction, based on the average direct employment during the 3rd quarter of each year. Using average quarterly employment as the basis for estimating the non-basic job response reflects the limited likelihood that businesses would hire additional workers in response to the temporary 1-month employment peak.

Operations and maintenance expenditures in the local economy, along with the consumer expenditures of staff during operations of PWP I and PWP II would support an estimated five indirect and induced jobs elsewhere in the economy over the long-term.

In light of the current labor market and established trade and service base in the area, all of the induced and indirect jobs are expected to be filled by local residents. In other words, no additional labor force in-migration or population gains would be expected in conjunction with these jobs. As a result, the assessments of effects on public facilities and services are based on the temporary and long-term population gains associated with the direct employment.

Table 5-13 PWP I and II Impacts on Total Employment in the Area of Site Influence.

	PWP I (2011)		PWP II (2012)	
	Peak Month	Peak Quarter	Peak Quarter	Operations
Direct On-Site Workers	168	121	99	6
Induced and Indirect**	48	48	40	5
Total Jobs Supported	216	169	139	11
Jobs Filled by Locals	98	77	64	8
Jobs Filled by Non-locals	118	92	75	3

** Induced and indirect employment are estimated using the following multipliers: 0.4 jobs per direct construction job (based on average employment during the peak quarter) and 0.8 jobs per direct operations job.

5.4.3 Population

Historic population conditions within the Area of Site Influence are described using historical data and population estimates from the U.S. Census Bureau and population projections prepared by the Wyoming Department of Administration and Information. Given the limited scale of the expected temporary and long-term population associated with the proposed projects, the focus of the analysis is on total county population and population by community.

5.4.3.1 Existing Conditions

Converse and Natrona counties both experienced population gains of approximately 12 percent since 2000; Converse County gaining 1,526 residents and Natrona County gaining 7,975 residents through 2009 - see Table 5-14. Much of the gain occurred in the latter half of the period, i.e., 2006 to 2009, a period marked by active oil and gas development, expansion in other mining activities, and the development of wind energy resources.

Table 5-14 Converse and Natrona County Population Trends (1990-2009).

	1990	2000	2006	2007	2008	2009
Wyoming	453,589	493,782	512,841	523,414	532,981	544,270
Converse County	11,128	12,052	12,627	12,874	13,263	13,578
Douglas	5,146	5,288	5,554	5,691	5,977	6,212
Glenrock	2,132	2,231	2,332	2,373	2,421	2,466
Lost Springs	4	1	1	1	1	1
Rolling Hills	336	449	496	503	508	512
Balance of Converse County	3,510	4,083	4,244	4,306	4,356	4,387
Natrona County	61,226	66,533	70,259	71,817	73,057	74,508
Bar Nunn	843	936	1,522	1,696	1,821	1,926
Casper	46,843	49,644	51,884	52,952	53,837	54,874
Edgerton	246	169	173	176	177	179
Evansville	1,480	2,255	2,331	2,359	2,420	2,504
Midwest	496	408	425	430	433	438
Mills	2,261	2,591	3,456	3,508	3,535	3,574
Balance of Natrona County	9,057	10,530	10,468	10,696	10,834	11,013

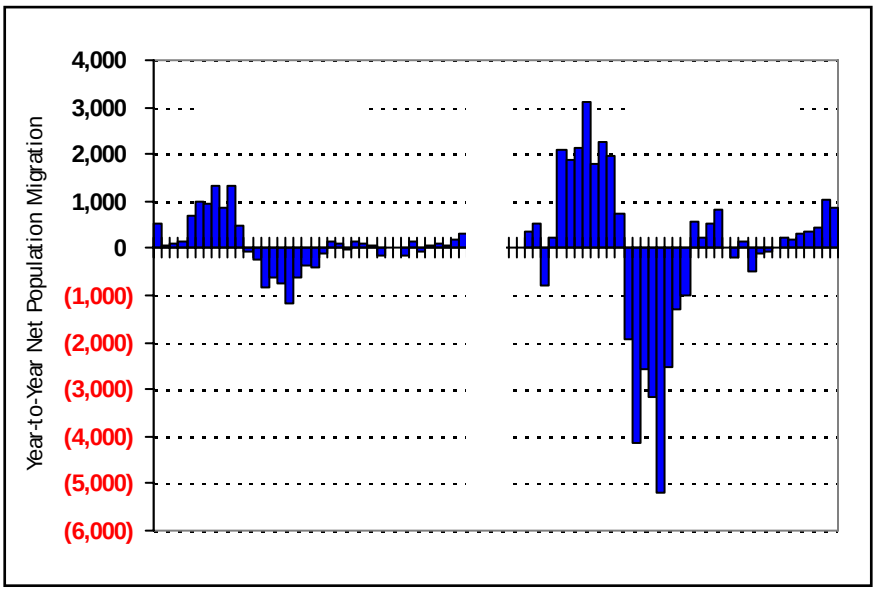
Sources: U.S. Census Bureau, 2000, 2010a, 2010b.

With the sole exception of Lost Springs (pop. 1), all of the communities in Converse and Natrona counties registered population growth between 2000 and 2009. In Converse County, the City of Douglas gained 924 residents to 6,212 in 2009, a 17 percent gain. Glenrock's population rose by 10 percent to 2,466 residents while Rolling Hills gained 63 residents, increasing to 512 in 2009. An estimated 4,387 residents of Converse County resided in unincorporated areas of the county, nearly 1-of-every-3 residents.

Population growth in Natrona County was concentrated in and around Casper. Casper itself gained more than 5,000 residents, with additional gains of 990, 983, and 249 residents, respectively, in the nearby communities of Bar Nunn, Mills and Evansville. In relative terms, Bar Nunn experienced the most rapid growth during the period, more than doubling its population. More than 11,000 residents, representing 15 percent of the county's population, live in unincorporated areas of Natrona County.

5.4.3.2 Population Migration

Population and work force migration are often a market-based response to imbalances in local labor markets and economic opportunity. A relative abundance of job opportunities, coupled with a relatively limited labor force, triggers net in-migration of workers and households, whereas a significant decrease in job availability can result in net out-migration. Although there are many reasons for such migration patterns, for example, the shift in population from the Midwest as manufacturing has declined, natural resource dependent economies are more susceptible to more rapid expansion-contraction cycles. The cycles may be related to sudden changes in market conditions as well as to cycles associated with the capital investment in infrastructure, which high levels of construction employment, followed by lower levels of operating employment. The completion of Basin Electric's Dry Fork station is a contemporary example of the latter. Migration due to both causes has played a part in the regional economy. Year-to-year migration trends covering the period 1971 to 2008 for Converse and Natrona counties are shown in Figure 5-18.



Note: Divisions on the horizontal axis represent annual intervals from 1970-1971 to 2007-2008

Figure 5-18 Year-to-Year Net Annual Migration, Converse and Natrona Counties, 1970-2008.

Net in-migration occurred during the mid-to-late 1970s, a period of concurrent energy resource exploration and development and significant capital investment. A period of significant out-migration followed, extending through the 1980s, as infrastructure was completed and energy resource development declined. Since then Converse County has experienced cyclic levels of net in and out migration, but of much lesser magnitude than that which occurred in the 1970s and 1980s. Net migration patterns in Natrona County paralleled those in Converse County, but were substantially larger in magnitude. According to the U.S. Census Bureau estimates, a net out-migration of more than 21,000 residents from Natrona County occurred between 1982 and 1990. Natrona County experienced net in-migration every year between 2000 and 2008. Insights gained from tracking patterns in the exchanges of drivers licenses suggest migration slowed dramatically, but remained positive into mid-2010.

5.4.3.3 Future Population

Population forecasts prepared by the Wyoming Department of Administration and Information, Economic Analysis Division (WEAD), prior to the economic downturn anticipated continued population growth for the state and in Converse and Natrona counties. Net population growth of 12 percent was projected in Converse County, resulting in a total population of 14,440 by 2025. Future population growth was

expected to mirror recent growth patterns, with most of the growth occurring in Douglas, the unincorporated areas, and town of Glenrock - see Table 5-15 below.

Net population growth of 10,610 was projected for Natrona County between 2007 and 2025. Of the total, 74 percent of the residents were expected to reside in Casper and 15 percent in unincorporated areas of the county. Population gains in Bar Nunn, Mills and Evansville were also projected, but at levels lower than their recent experience would suggest.

Table 5-15 Population Forecasts for State, Counties, and Places.

	2007 Estimate	2010 Forecast	2015 Forecast	2020 Forecast	2025 Forecast	Percentage Change 2007-2025
Wyoming	522,830	539,740	560,000	578,730	598,100	75,270
Converse County						
Douglas city	5,675	5,839	6,020	6,183	6,368	693
Glenrock town	2,371	2,440	2,515	2,583	2,661	290
Lost Springs town	1	1	1	1	1	0
Rolling Hills town	498	512	528	543	559	61
Balance of Converse County	4,323	4,448	4,586	4,710	4,851	528
Total	12,868	13,240	13,650	14,020	14,440	1,572
Natrona County						
Bar Nunn town	1,700	1,754	1,822	1,887	1,951	251
Casper city	53,003	54,702	56,822	58,839	60,841	7,838
Edgerton town	175	181	188	194	201	26
Evansville town	2,329	2,404	2,497	2,585	2,673	344
Midwest town	432	446	463	480	496	64
Mills town	3,133	3,233	3,359	3,478	3,596	463
Balance of Natrona County	10,978	11,330	11,769	12,187	12,602	1,624
Total	71,750	74,050	76,920	79,650	82,360	10,610

Sources: Wyoming Department of Administration and Information, Economic Analysis Division, 2008,, U.S. Census Bureau, 2010a, 2010b.

5.4.3.4 Construction Impacts

Construction of PWP I and PWP II would result in temporary in-migration of non-local workers. Based on local hiring targets of 30 percent, the total number of such workers would average about 85 during the peak 3-months in 2011 and 76 workers during 2012. A short-term peak of 118 temporary workers would reside in the area in August 2011. That number represents less than 0.2 percent of the combined population of the two counties, and a fraction of the number of business travelers, temporary workers and tourists typically staying at hotels/ motels and other short-term lodging in the area. Although development of the projects would support some indirect and induced jobs, no incremental population impact is anticipated in conjunction with those jobs. Rather, the secondary effects are likely to increase productivity and support existing jobs that are already in the local economy.

5.4.3.5 Operations Impacts

A total of six permanent jobs are anticipated during operations. The goal is to hire 50 percent of those employees from the local labor force, with the other 50 percent relocating to the area, which would yield a total non-local PWP I and PWP II operating workforce of three employees. Although operations and maintenance of PWP I and PWP II would generate additional indirect and induced jobs in the local economy, these are likely to be spread across a number of sectors and be filled by increased productivity or by local worker. Assuming the 2000 average Wyoming household size of 2.48 or average family size of 3.0 (U.S. Census Bureau 2002), the PWP I and PWP II non-local operations workforce is anticipated to add less than ten additional residents to the recommended area of Site Influence. Section 5.4.5 below provides estimates of population gain for each of the suggested Primarily Affected Local Governments during the peak construction quarter. For both counties and all communities the gain would be less than one percent of 2009 population. Moreover, given the current economic conditions, such gains are likely to be viewed as benefits.

5.4.4 Housing

The following housing analysis characterizes existing housing resources in the study area and assesses the ability of those existing resources to accommodate housing demand associated with a peak of 118 non-local construction workers and, as many as three relocating operations workers.

5.4.4.1 Existing Conditions

Conventional Housing Stock

For the purposes of this assessment, "conventional housing" includes single-family attached and detached homes, duplexes, multifamily units (apartments, condominiums, and town houses) and mobile homes. The 2000 census reported a total of 5,669 housing units in Converse County and 29,882 units in Natrona County. By 2009, total Converse County housing stock had increased by eight percent to 6,134 units and Natrona County total housing units had increased to 32,222, also an increase of eight percent (See Tables 5-16 and 5-17 below).

Single-family detached homes comprise the majority of housing stock in both counties in 2000, approximately 63 percent in Converse County and 69 percent in Natrona County. Multifamily housing of three or more units comprised about 13 percent of all units in Converse County and 14 percent in Natrona County. Mobile homes comprised about 18 percent of Converse County housing stock and about 13 percent of Natrona County housing stock.

Table 5-18 displays the number of housing units by county and community for the 2000 census. Although these data are more than a decade old, they provide a relative measure of the housing stock within each community and ownership status of those units at that time. The occupancy data is also obviously dated. The U.S. Census Bureau's American Community Survey (ACS) data for 2009 covered housing in Natrona County but not Converse County. For 2009, the ACS data indicated that 11.7 percent of housing units in Natrona County were vacant, compared to 10.2 percent in 2000, and 26.8 percent of total housing units were renter occupied, compared to 27.0 percent in 2000 Census (U.S. Census Bureau 2010d).

Table 5-16 Housing Stock by Type of Structure (2000).

County	Single Family Detached	Single Family Attached	2 Units	3 or More Units	Mobile Homes	Boat, RV, Vans, Etc.	Total
Converse	3,597	216	55	726	1,015	60	5,669
Natrona	20,608	524	558	4,306	3,788	98	29,882

Source: U.S. Census Bureau, 2001b.

Table 5-17 Total Growth in Converse and Natrona Counties Housing Stock: 2000-2009.

	Converse County	Natrona County
2000	5,674	29,917
2001	5,700	30,073
2002	5,723	30,197
2003	5,751	30,309
2004	5,834	30,501
2005	5,860	30,752
2006	5,912	31,144
2007	5,942	31,516
2008	6,044	31,874
2009	6,134	32,222
Total Change	460	2,305
Percent Change	8.1%	7.7%

Source: U.S. Census Bureau, 2010c.

Table 5-18 Selected Characteristics of Housing Stock (2000).

	Total Housing Units	Units Occupied	Units Vacant	Units Owner Occupied	Units Renter Occupied
Wyoming	223,854	193,608	30,246	135,488	58,120
Converse County	5,669	4,694	975	3,479	1,215
Douglas	2,417	2,153	264	1,460	693
Glenrock	1,126	920	206	647	273
Rolling Hills	142	137	5	120	17
Natrona County	29,882	26,819	3,063	18,757	8,062
Bar Nunn	336	319	17	292	27
Casper	21,978	20,437	1,541	13,779	6,658
Evansville	917	851	66	481	370
Midwest	229	162	67	132	30
Mills	1,286	1,166	120	808	358
Study Area Total	35,551	31,513	4,038	22,236	9,277

Source: U.S. Census Bureau, 2001a.

Figure 5-19 shows the annual number of housing units authorized for construction by Converse and Natrona counties between 2000 and 2009.

According to information reported by the Economic Analysis Division of the Wyoming Department of Administration and Information, Converse County authorized construction of 460 total housing units since 2000; 71 percent were single family homes and 29 percent were duplexes and multi-family homes. Natrona County authorized construction of 3,080 total units during that period; of those 94 percent were single-family homes and 6 percent were duplexes and multifamily homes (WDAI 2010). Given the net change in housing stock reported by the Census Bureau, it appears that approximately 25 percent of the units authorized for construction in Natrona County were cancelled or have not yet been completed.

Temporary Housing

"Temporary housing" includes hotel and motel rooms and recreational vehicle (RV) park spaces or pads. For non-local construction workers, such housing typically represents the most common option. As shown in Table 5-19, there are 3,105 motel rooms and 410 RV pads within the study area.

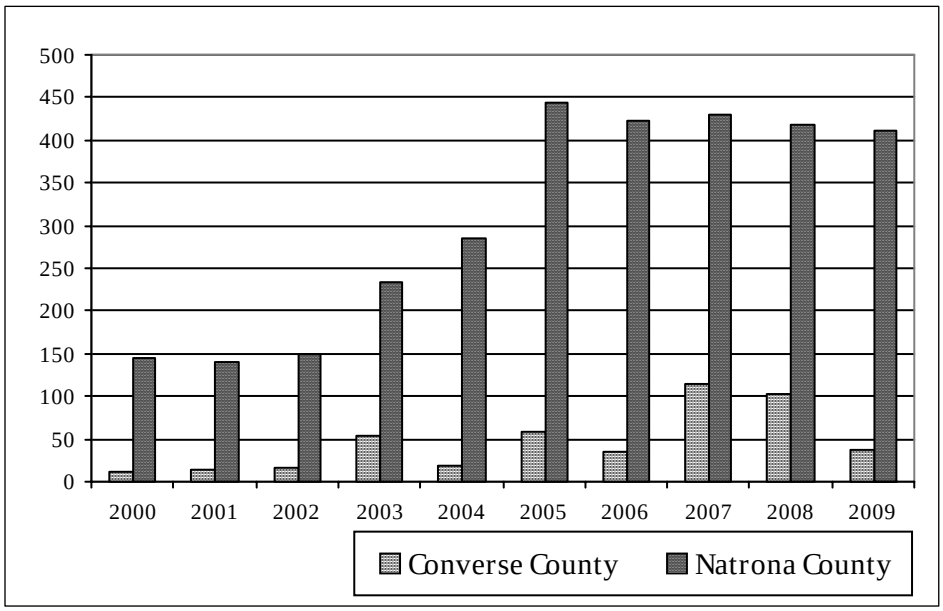


Figure 5-19 Total Annual Housing Units Authorized for Construction, 2000-2009 Converse & Natrona Counties. Source: WDAI, 2010.

Table 5-19 Temporary Lodging Units within the Area of Site Influence.

	Hotels & Motels		RV Parks	
	Establishments	Rooms	RV Parks	Pads
Converse County Total	10	436	7	158
Douglas	7	379	5	116
Glenrock	3	57	2	42*
Rolling Hills	0	0	0	0
Natrona County Total	32	2,669	8	252
Bar Nunn	0	0	1	n/a
Casper	26	2,250	6	202
Evansville	5	419	1	50
Mills	1	n/a	0	0
Study Area Total	42	3,105	15	410

Sources: Wyoming Travel and Tourism, 2010; contacts with lodging proprietors.
* An RV park in Glenrock will be adding 28 spaces during the spring of 2011.

Mobile Home Parks

Mobile home parks provide both short-term and long-term housing options. Table 5-20 provides current estimates of mobile home parks and pads in Converse and Natrona Counties and the primarily affected communities. The number of pads reported in Natrona County is conservative in that it reflects the capacity for 10 of 21 parks in Casper and 1 of 2 parks in Evansville. Consequently, there are more pads in those communities than are reported in this table.

Table 5-20 Mobile Home Parks within the Area of Site Influence, 2010.

	Mobile Home Parks	
	Total Parks	Number of Pads*
Converse County Total	6	336
Douglas	5	336
Glenrock	0	0
Rolling Hills	0	0
Natrona County Total	23	801
Bar Nunn	0	0
Casper	21	603
Evansville	2	198
Mills	0	0
Study Area Total	29	1,137*

Source: Mobile Home Park Store, 2010.
* Not all parks list the total number of number of pads; therefore, the study area total does not include all pads.

5.4.4.2 Conventional Home Sales Prices and Availability

Historic Home Sales Prices

Housing costs in the two counties and the state as a whole increased substantially between 2006 and 2007 (16.5 percent in Converse County, 26.6 in Natrona County and 41 percent in the State as a whole). Sales prices moderated in 2008--likely because of the economic slowdown. During 2008, the average sales price of a detached single-family home in Converse County was $186,131, up 7.9 percent from the previous year. In Natrona County, the average sales price in this category was $204,154, up 1.4 percent from the previous year. These prices are in contrast to the Wyoming statewide average price for a detached single-family home in 2008, which was $256,045, a decrease of 3.4 percent over the previous year - see Figure 5-20 (Wyoming Housing Database Partnership, 2010).

Current Housing Market

Table 5-21 below describes current (November 2010) information about homes for sale in Converse and Natrona counties.

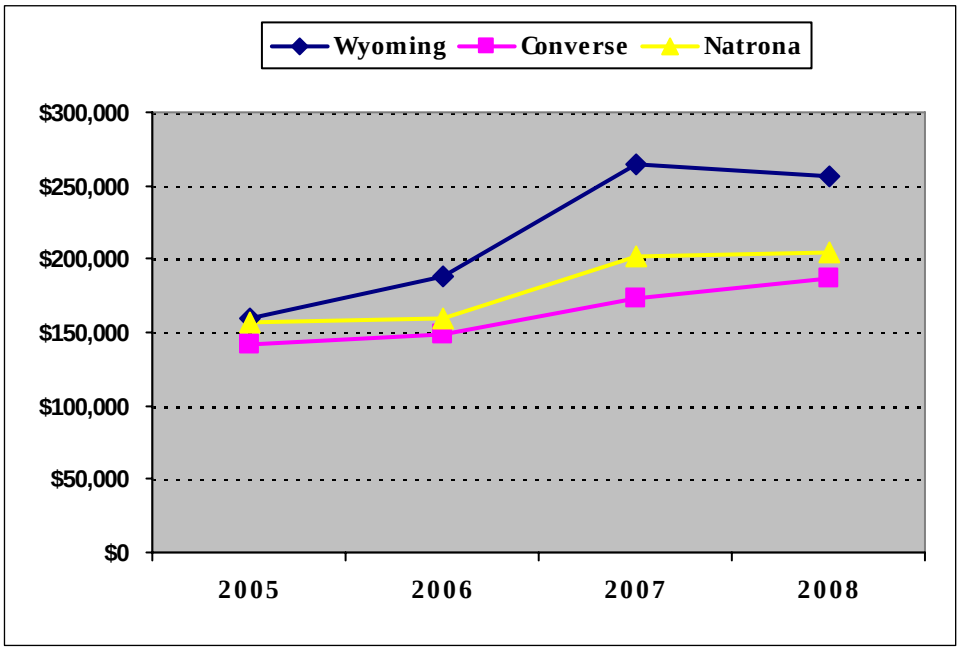


Figure 5-20 Average Housing Sales Prices, Wyoming, Converse, and Natrona Counties: 2005-2008. Source: Wyoming Housing Data Base Partnership 2010.

Table 5-21 November 2010 Housing Sales Information; Converse and Natrona Counties and Casper Area.

	Converse County	Natrona County	Casper Area
Single Family Homes for Sale	100	299	268
Average Days on Market	290	110	111
Number Sold Year to Date	114	865	729
Average Sales Price	$172,662	$195,716	$200,927
Average Listed Price	$187,090	$208,503	$213,773

Source: Iiams 2010.

In November 2010 there were 100 homes listed for sale in Converse County and 299 for sale in Natrona County, 268 of which were in the Casper area. Average home asking prices for the listed homes were $187,090 in Converse County and $213,773 in the Casper area.

5.4.4.3 Rental Housing Monthly Rents and Vacancy Rates

Rental Housing Costs

The Wyoming Housing Database partnership surveys housing rental rates by county on a semiannual basis. Table 5-22 presents 2nd quarter 2009 rental rates--the most recent available at the time of this assessment--for houses, apartments, mobile homes and mobile home pads for Converse and Natrona County and for the state as a whole. Natrona County house and apartment rental rates are somewhat higher than the state average while mobile home and mobile home pad rental rates are lower than the state average. Converse County rental rates are lower than the state average in every category.

Figures 5-21 and 5-22 display recent trends in housing and apartment rental rates respectively for Converse and Natrona Counties and for the state as a whole. The substantial increase in rental rates that occurred beginning in 2007 in both counties and the state reflect the energy boom that was occurring at that time. Rental prices moderated during late 2008 and 2009 in most cases.

Rental Housing Vacancies

The Wyoming Housing Database Partnership also surveys rental housing vacancy rates on a semiannual basis. Table 5-23 displays recent rental vacancy rate trends for Converse and Natrona counties. The recent energy boom and economic slowdown can be seen in low vacancy rates in the earlier years of the period and the increasing vacancy rates in 2009.

Table 5-22 Housing Rental Rates Wyoming, and Converse and Natrona Counties, 2nd Quarter 2009.

	Houses	Apartments	Mobile Homes	Mobile Home Pads
Wyoming	$919	$650	$620	$270
Converse County	$673	$622	$550	$180
Natrona County	$1,032	$710	$603	$254

Source: Wyoming Housing Database Partnership 2010.

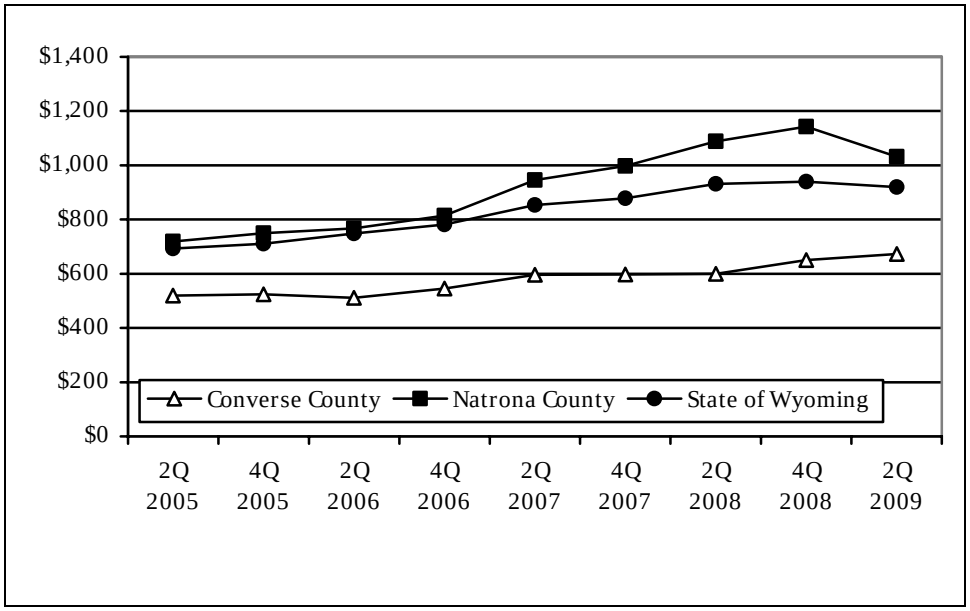


Figure 5-21 House Rental Rates, Wyoming and Converse and Natrona Counties: 2005-2009. Source: Wyoming Housing Database Partnership 2010.

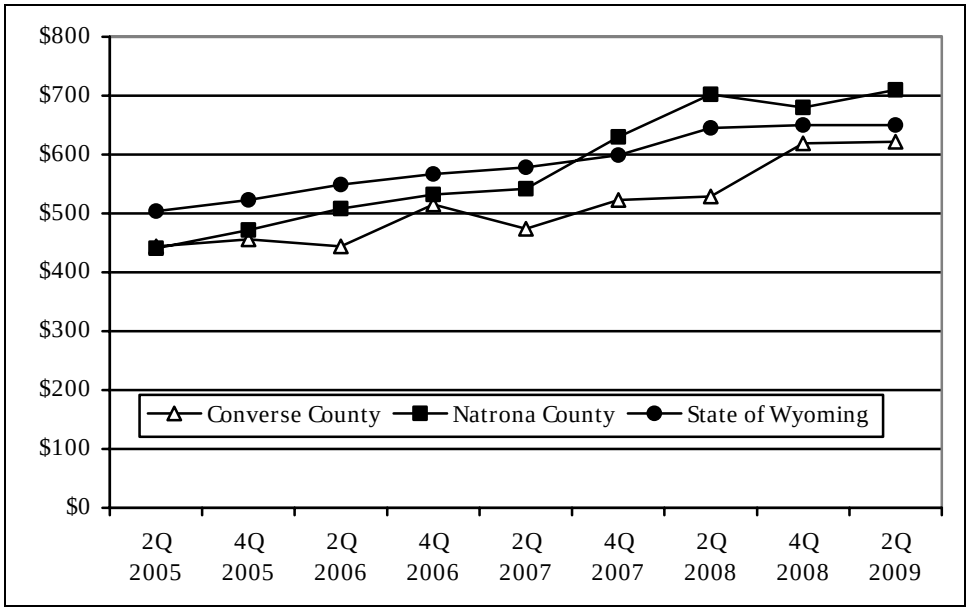


Figure 5-22 Apartment Rental Rates, Wyoming and Converse and Natrona Counties: 2005-2009. Source: Wyoming Housing Database Partnership 2010.

Table 5-23 Semi-annual Rental Housing Vacancy Rates: Converse and Natrona Counties.

Period	Converse County	Natrona County
June 2005	5.1%	2.7%
December 2005	2.3%	2.0%
June 2006	4.7%	1.6%
December 2006	1.4%	1.7%
June 2007	0.8%	0.6%
December 2007	0.5%	1.1%
June 2008	1.6%	1.1%
December 2008	2.0%	1.0%
June 2009	2.7%	3.2%
December 2009	6.9%	4.8%

Source: Wyoming Housing Database Partnership 2010.

5.4.4.4 Temporary Housing Availability and Rates

Hotels, motels and RV parks serve a variety of customers including destination and pass-through travelers (such as travelers on I-25), attendees of conventions, conferences, sporting events, fairs and family events such as weddings and holidays, commercial travelers and temporary industrial and public infrastructure construction and maintenance workforces. Temporary housing occupancy and vacancy rates are typically seasonal, with higher occupancy and fewer vacancies during summer months and, in some areas, during hunting season.

A total of 15 hotels and motels representing 1,271 rooms (41 percent of all rooms in the study area) and 4 RV parks representing 141 pads (34 percent of total pads in the study area) were contacted during development of the Projects' housing program (Appendix E). Proprietors of these establishments indicated that occupancy and vacancy rates were variable depending on the time of year. Some proprietors reported that occupancy rates ranged from approximately 90 percent in August to approximately 50 percent in December.

Motel/hotel room rates quoted in the responses to WWI housing program inquiries ranged from $121.00 to $56.00/night depending on the type of room and the time of year. Some motels and hotels offer reduced weekly and monthly rates. RV pad rates ranged from about $123.00 to $232.00 per week.

Many hotels, motels and RV parks indicated a willingness to reserve rooms and spaces and offer a preferential rate based on a commitment. Although reserving a large number of rooms in any one establishment might mean that that particular establishment would have reduced availability during peak visitor periods and events, the proprietor would be assured higher overall occupancy, particularly in off-peak months, and be less subject to the fluctuations of the market.

5.4.4.5 Future Demand (Without PWP I and II)

The Wyoming Housing Database Partnership prepares annual forecasts of future housing needs. The forecast are for conventional housing. The 2009 report forecasts housing needs through 2030 for three growth scenarios: moderate, strong and very strong growth. The Projects' housing demand would stabilize by 2013, so this assessment focuses on housing demand within the 2010-2015 period. In Converse County, demand for housing to accommodate an additional 459 households was forecast under the Strong Growth Scenario, including 101 rental units and 358 owner-occupied units. In Natrona County, demand for housing to accommodate an additional 2,897 households was forecast under the Strong Growth Scenario, including 835 rental units and 2,062 owner-occupied units (Wyoming Housing Database Partnership 2010).

PWP I and PWP IIs' demand for temporary housing units would occur during third and fourth quarter of both 2011 and 2012. Future demand for temporary housing during those periods would depend on the general state of the national economy, which would affect tourism, recreation business and event-related travel, other major construction projects occurring in Converse and Natrona County at the time and oil and natural gas development.

5.4.4.6 Construction Impacts

The assessment of the effects of the PWP I and PWP II construction workforce on housing is based on the anticipated peak workforce month, which is expected to occur in August 2011. All other months of both construction segments are anticipated to have smaller housing demand.

Construction Workforce Housing Demand

Table 5-2 in Section 5.3.1 of this assessment displays the construction workforce for the two proposed Projects. Table 5-3 in Section 5.3.2 presents the estimated portion of that workforce that would be non-local and therefore require temporary housing accommodations while working on the projects.

Recent Converse County Wind Energy Project Experience

Figure 5-23 presents the workforce residence distribution by housing type for the peak workforce quarter of three recent Glenrock-area wind energy projects. For all projects, most peak quarter workers were housed in motels, ranging from 75 percent during the peak construction quarter of the Glenrock/Rolling Hills project to about 53 percent during the peak construction quarter of Campbell Hill. RV parks accommodated a range of about 25 percent for Campbell Hill to about four percent for Glenrock/Rolling Hills. About 15 to 17 percent of non-local workers stayed in residences (houses and mobile homes) and 4 to 12 percent lived in apartments.

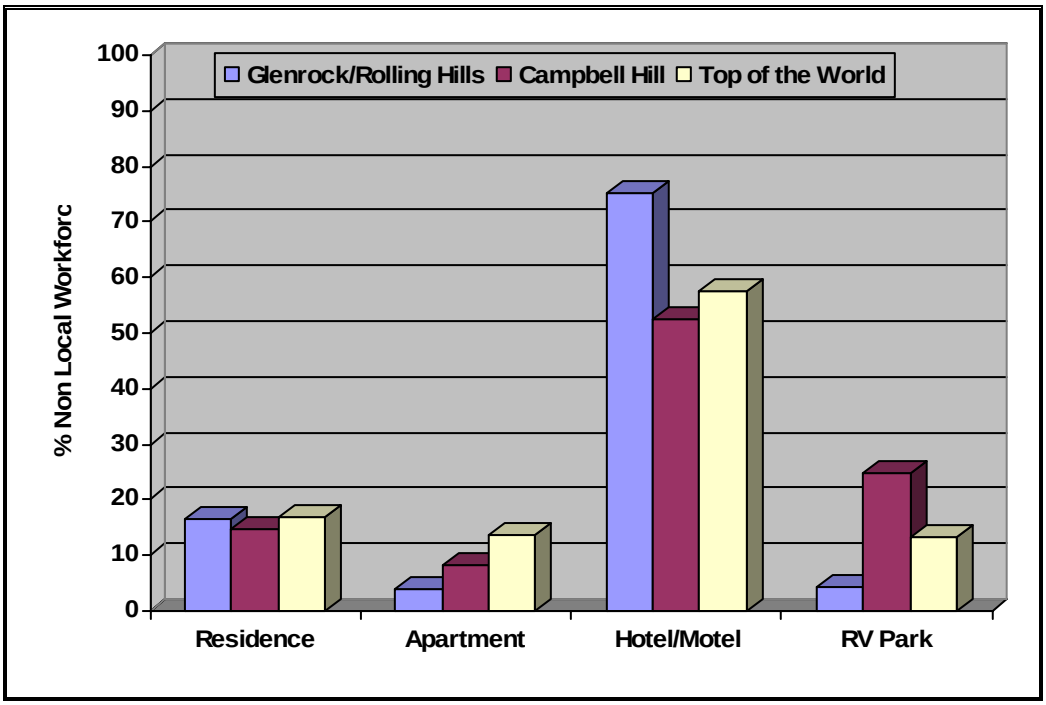


Figure 5-23 Recent Glenrock Area Wind Energy Project Peak Quarter Non-Local Worker Housing. Note: The "Residence" category includes both houses and mobile homes. Sources: Peak Quarter WISD Monitoring Reports: Glenrock Rolling Hills, Campbell Hill and Top of the World wind energy projects.

5.4.4.7 Housing Occupancy by Type

Figure 5-24 and Table 5-24 below compare estimated total, non-local and local construction workforces for PWP I and II with those of the three recent Glenrock-area wind energy projects. As can be seen from the figure and table, PWP I and PWP II peak construction workforce would be substantially smaller than those associated with previous projects, reflecting the fact that the two projects are being completed in two different construction periods and there are fewer turbines associated with each PWP I and PWP II.

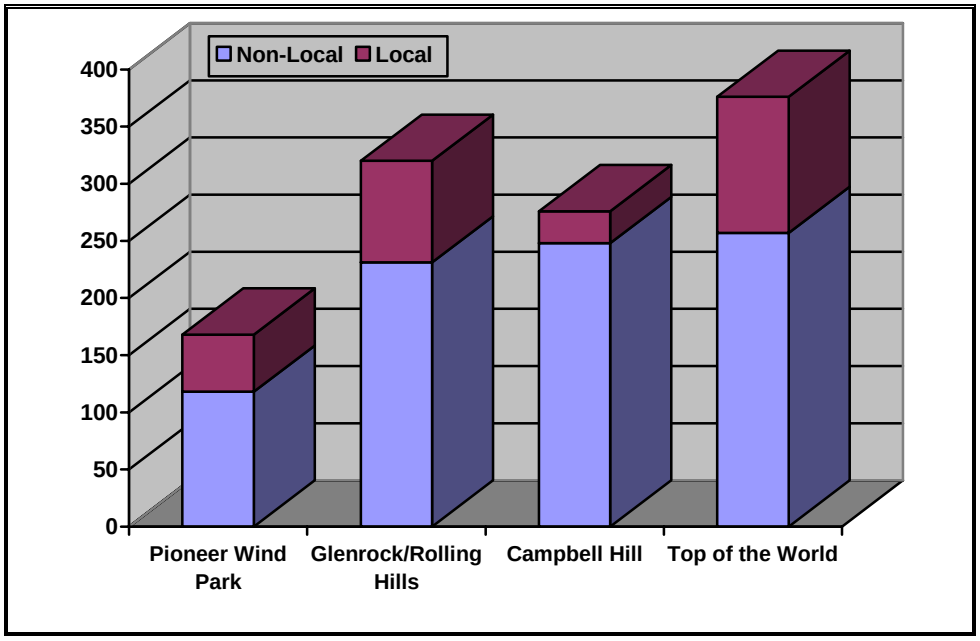


Figure 5-24 Peak Construction Quarter Workforce Total, Non-Local and Local Workers, Pioneer Wind Park (PWP I and II, combined) and Other Recent Glenrock Area Wind Energy Projects. Sources: Peak Quarter WISD Monitoring Reports: Glenrock Rolling Hills, Campbell Hill and Top of the World wind energy projects, WWI, BCLLC/SDLLC.

Table 5-24 Peak Construction Workforce for PWP I and PWP II and recent Converse County Wind Energy Projects.

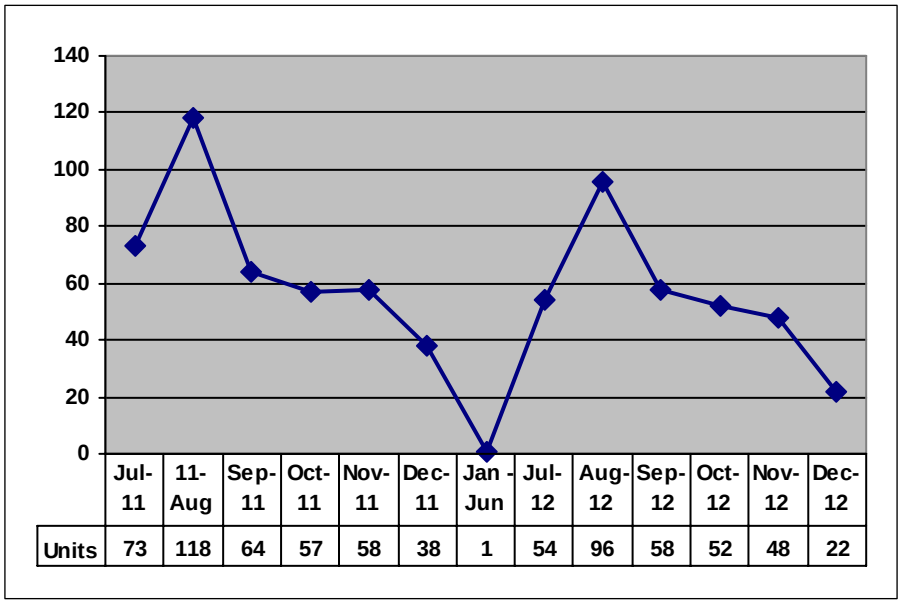
Project	PWP I and PWP II (Estimated)	Glenrock/ Rolling Hills	Campbell Hill	Top of the World
Peak Construction Workforce	168	320	276	376
Peak Non-Local	118	231	248	257
Peak Non-Local %	70%	72%	90%	68%

Sources: Peak Quarter WISD Monitoring Reports: Glenrock Rolling Hills, Campbell Hill and Top of the World wind energy projects, WWI, BCLLC/SDLLC.

5.4.4.8 Number of Units Required

Figure 5-25 provides a table and graph of estimated housing units needed to accommodate the PWP I and PWP II construction workforce. With no shared occupancy rooms, a maximum peak of 118 units would be required in August of 2011, decreasing each month to 38 units in December of 2011 for the first project. Assuming an average occupancy of 1.25 workers per unit, not an unreasonable assumption given information drawn from monitoring reports on other projects, the short-term demand would drop to 95 units. One unit would be needed from January to June of 2012. As construction of the second project begins, an estimated peak of 96 units (77 units allowing for some shared occupancy) would be required in August of 2012, decreasing to 22 units in December of 2012.

Because of the short duration of the construction portion of each project, the bulk of PWP I and II construction-related housing demand would likely be for hotel/motel and RV park units. Although a few construction management staff may seek to rent houses, mobile homes or apartments, it is not clear how many would be able to find rental units for a period of six months or less.



	Jul-11	11-Aug	Sep-11	Oct-11	Nov-11	Dec-11	Jan - Jun	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
Units	73	118	64	57	58	38	1	54	96	58	52	48	22

Figure 5-25 Estimated PWP I and PWP II Construction Worker Housing Demand, by Month. Assumes no shared occupancy; with shared occupancy, demand would be 20 percent lower with an average of 1.25 occupants per unit. Sources: WWI, BCLLC/SDLLC.

As will be discussed in Section 5.4.7 (Cumulative), no other major construction projects are anticipated to occur at this time. Although the general state of the economy and future levels of oil and gas development are difficult to forecast with confidence, the existing large motel/hotel room and RV pad base in the two counties (a total of 3,515 units) would likely be able to accommodate the limited short-term demand increment associated with the Projects (95 to 118 units during the peak) with little difficulty.

5.4.4.9 Construction Workforce Housing Program

Existing temporary housing resources within the recommended Area of Site influence would be more than adequate to accommodate the relatively small and short-term demand for housing associated with non-local construction workforce associated with both Projects. To ensure that adequate housing resources were available, WWI conducted an inventory of area motel/hotel and RV park owners to assess potential availability, room and RV pad rates and willingness of proprietors to accommodate the non-local construction workforce. The inventory was conducted by phone and email during the fall of 2010. Table 5-25 displays the motel, hotel and RV Park availability information obtained from proprietors who responded to the WWI inventory in writing and provided a forecast of availability. Additional proprietors expected their availability to be good during the construction periods for the two projects, but were omitted from the inventory because they did not provide an estimate of availability. Appendix E provides the proprietors' letter responses to the inventory.

Table 5-25 PWP I and PWP II Inventory of Available Temporary Housing.

Motels/Hotels	City	Total Rooms	Minimum Availability
Mabuhay Hotel	Glenrock	12	8
Best Western Douglas Inn	Douglas	117	17
Holiday Inn Express	Douglas	76	20
La Bonte Hotel Rooms	Douglas	21	11
La Bonte Hotel Apartments	Douglas	10	2
Sleep Inn	Douglas	63	6
Holiday Inn	Casper	119	60
Ramada Plaza Riverside	Casper	200	88
Motels/Hotels Subtotal			211
RV Parks	**City**	**Total RV Pads**	**Minimum Availability**
Deer Creek RV Park	Glenrock	35	21
River Bend RV Park	Glenrock	11	8
RV Parks Subtotal			29
Temporary Housing Total			240

Source: WWI Temporary Housing Inventory.

Comparing the minimum availability of temporary housing shown in the table to the project-related demand of 118 units (Figure 5-25) indicates sufficient housing availability to meet each projects needs.

5.4.4.10 Effects on Local Motel/Hotel and Recreational Vehicle Park and Other Rental Housing Occupancy

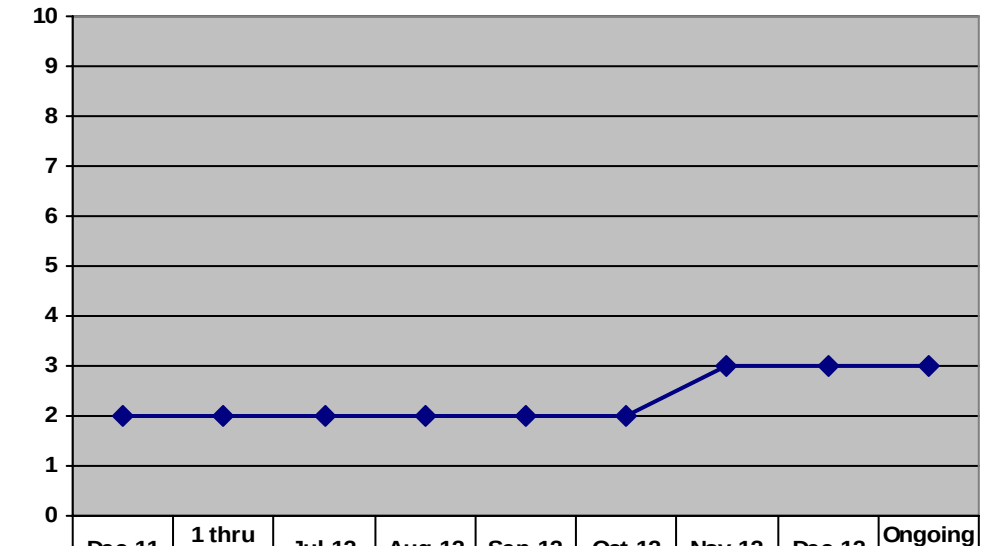
The demand for a peak of 95 to 118 housing units--primarily motels and RV pads--would utilize about three percent of the 3,515 total motel/hotels and RV pads in the recommended Area of Site Influence. Consequently, effects on occupancy rates of these units are likely to be limited though generally beneficial. Although some workers may seek and find short term house, mobile home, and apartment rentals, these numbers are likely to be very limited given the short-term (less than six months for most workers) nature of each of the Projects and consequently have a negligible effect on vacancy rates in either county.

5.4.4.11 Operations Impacts

Figure 5-26 below portrays anticipated operations housing demand for the two Projects, which is estimated to be three units. Demand would begin in December of 2011 as the first project nears completion. Given the large housing base in the recommended Area of Site Influence, the absorption of three units would have a negligible effect on housing conditions in the area.

5.4.5 Public Facilities and Services

The following sections describe current conditions of the public facilities and services listed in Section 7 (i)(vi) and discusses potential effects of the two Projects on those systems in the context of anticipated population growth through 2015. Experience on three previous Glenrock-area wind energy projects has shown that the majority of non-local project workers chose to live in Casper, with smaller numbers living in Glenrock and Douglas. Although Rolling Hills, Bar Nunn, Evansville and Mills are also within the recommended Area of Site Influence of the Projects, ISC monitoring data for the previous Glenrock area wind energy projects indicates that few, if any, non-local construction workers lived in these communities. Given that five motels are located in Evansville, it is possible that some construction workers on previous Glenrock area wind energy projects may have listed their residence as Casper when in fact they were staying in Evansville. Consequently more construction workers may have resided in Evansville that indicated by the monitoring reports. However, since those workers were likely in motels



	Dec-11	1 thru 6/2012	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Ongoing O&M
Units	2	2	2	2	2	2	3	3	3

Figure 5-26 Estimated PWP I and PWP II Operating and Maintenance Worker Housing Demand, by Month. Source: BCLLC/SDLLC.

for a brief period of time, and local officials reported no community impacts with previous wind energy construction projects, the conclusions about their effects on infrastructure and services likely remains valid. Given that the construction workforce for both PWP I and PWP II will be substantially smaller at peak than the previous three projects, it is anticipated that public facilities and services within these communities will not be affected by construction of the project. Furthermore, because most of the temporary work force would reside in existing motels and RV parks that serve tourists, business visitors and other temporary residents, the demand associated with the PWP I and PWP II construction work force is, in essence, already factored into service planning and delivery for most local governments and service agencies. In other words, the project would create little, if any, need to expand services or hire staff.

5.4.5.1 PWP I and PWP II Peak Construction Workforce-Related Public Facilities and Services Demand

The effects of the Projects on public facilities and services would result from the demand created by construction and operations workers and, in the case of Converse County, with demand associated with transportation, construction and operations activities on the project sites and along access roads leading to the sites.

For assessment purpose, the aforementioned demand is assessed for the anticipated peak quarter of construction and during operations. Figure 5-27 displays population estimates by community for the peak construction month.

As shown in Figure 5-28, based on the PWP I and PWP II construction workforce estimates and the distribution patterns of non-local workers during previous Glenrock-area wind energy construction projects, an estimated 23 non-local workers would live in Glenrock during the peak construction month, six would live in Douglas and 97 would live in Casper. Evansville and Mills would each host one construction worker and none would live in Rolling Hills or Bar Nunn. Although PWP I and PWP II non-local construction workforce residency patterns may differ somewhat than those, as shown by Figure 5-28, the peak construction population would be less than one percent of 2009 population in each of the primarily affected counties and communities, so minor changes in distribution patterns would likely not alter the conclusions of the following public facilities and services assessment.

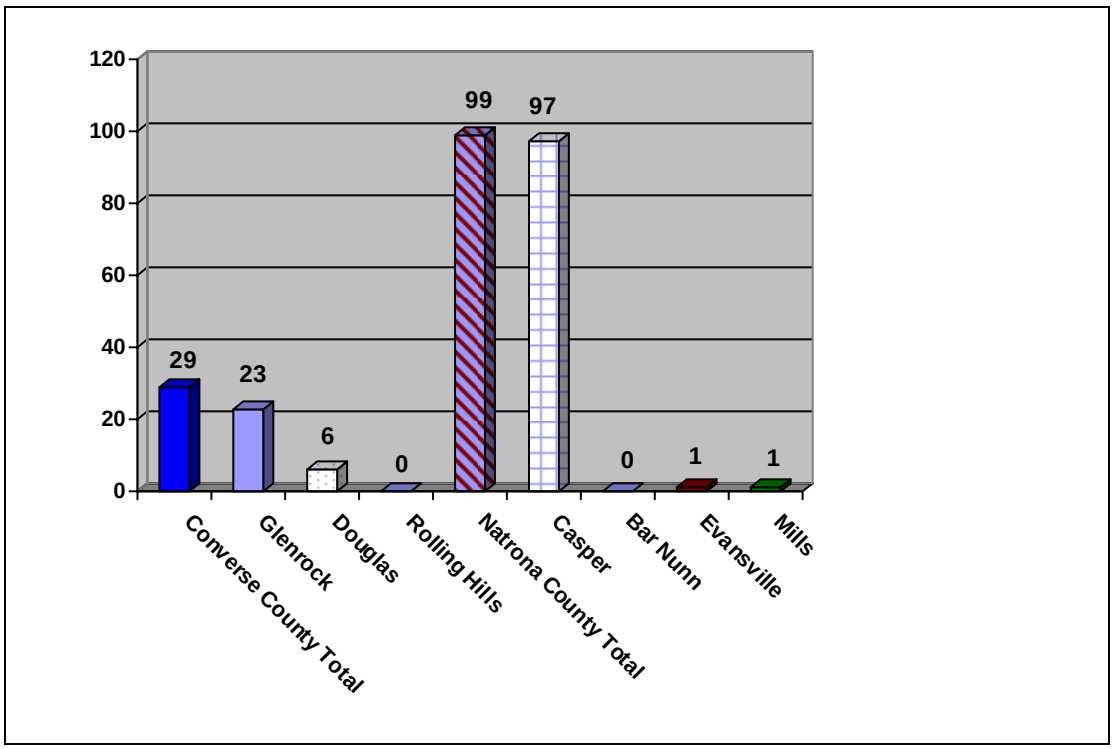


Figure 5-27 Estimated Peak Non-Local Construction Workforce Population Distribution. Source: BCLLC/SDLLC estimates.

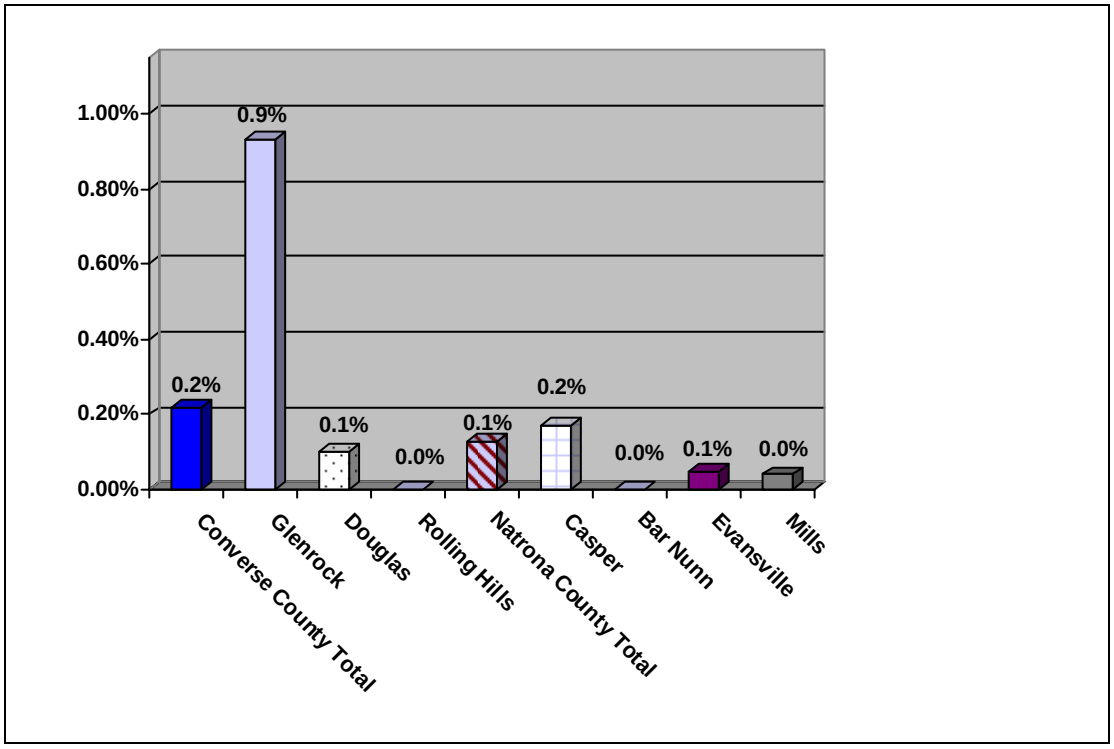


Figure 5-28 PWP I and PWP II Peak Non-Local Construction Worker Population as a Percentage of 2009 County and Community Population. Source: U.S. Census Bureau, 2010b, BCLLC/SDLLC.

5.4.5.2 PWP I and II Operations Workforce-Related Public Facilities and Services Demand

Total PWP I and PWP II operations-related population is anticipated to be less than 10 persons. Although there are no ISC monitoring data for residency of operations workers, the total operations related workforce would not represent a major population increment for any of the primarily affected communities.

5.4.5.3 Demand from Population Growth Unrelated to PWP I and PWP II Construction and Operations

Table 5-26 displays 2009 population estimates and 2015 population forecasts for the recommended Primarily Affected Units of Local Government. As shown in the table, forecast population change between 2009 and 2015, which covers the period when the two Projects' population change would occur (2011 and 2012), ranges from about a 4.5 percent gain in Casper to a 6 percent decline in Mills.

Table 5-26 Forecast Population Growth between 2009 and 2015 for Recommended Primarily Affected Local Governments.

Local Government	2009 Population	2015 Population	Change	Percent Change
Converse County	13,578	13,650	72	0.53%
Glenrock	2,466	2,515	-192	1.99%
Douglas	6,212	6,020	49	-3.09%
Rolling Hills	512	528	16	3.18%
Natrona County	74,508	76,920	2,412	3.24%
Casper	54,874	56,822	1,948	3.55%
Bar Nunn	1,926	1,822	-104	-5.37%
Evansville	2,504	2,497	-7	-0.29%
Mills	3,233	3,359	-215	-6.02%

Sources: Wyoming Department of Administration and Information, Economic Analysis Division, 2008,,, U.S. Census Bureau 2010b, BCLLC/SDLLC.

5.4.5.4 Administrative Facilities

Facilities required for the administrative functions of government include County courthouses and administrative buildings and city and town halls. Converse County administrative facilities are located in the Converse County Courthouse in Douglas. Natrona County administrative facilities are located in the Natrona County Courthouse in Casper. Douglas and Casper house their administrative facilities in their respective city halls and Glenrock, Rolling Hills Evansville, Mills and Bar Nunn house their administrative facilities in their respective town halls.

Construction Impacts

As demonstrated in Figures 5-27 and 5-28, the small, short-term and temporary PWP I and PWP II construction workforce would comprise less than one percent of 2009 population in each of the primarily affected communities during the peak construction quarter. Communities are unlikely to add staff or improve facilities for such small and short-term population increases. Therefore, impacts on facilities required for the administrative functions of government would not be anticipated for any of the recommended Primarily Affected Units of Local Government, even when added to population growth from other sources.

Operations Impact

The small incremental population associated with the two proposed Projects' operations would have no appreciable effect on the administrative functions of government in any of the primarily affected local governments, even when added to population growth from other sources. Consequently, no changes in administrative facilities would be required.

5.4.5.5 Wastewater and Water Distribution and Treatment Facilities

Wastewater Collection and Treatment

Three wastewater systems are anticipated to be minimally affected by the two proposed Projects: the Glenrock and Douglas Systems in Converse County and the Casper system including the Sam Hobbs Regional Wastewater Treatment Facility in Natrona County.

Glenrock

The Glenrock wastewater treatment system was originally designed to accommodate 3,000 residents. At the time of this assessment, Glenrock has applied to the Wyoming DEQ for a permit to improve the system, and those improvements would provide an ultimate design capacity for 5,000 residents (Glenrock's estimated 2009 population was 2,466 residents). Glenrock anticipates that the improvements will be completed by mid 2011 (Andrews 2004 and 2010).

Douglas

The Douglas wastewater treatment system was designed to accommodate 15,000 residents (Douglas' 2009 population was estimated to be 6,202) (City of Douglas 2004).

Casper

The Sam Hobbs Regional Wastewater Treatment Facility has a design capacity of 12.8 million gallons per day (mgd) and had a 2007 average flow of 6.7 mgd, about 52 percent of design capacity (USEPA 2008).

Construction Impacts

Because construction-related populations would occupy existing housing resources, which are already served by sewer collection systems, the two Projects' demand would not affect any collection systems.

Glenrock

The anticipated peak construction-related population in Glenrock (23 persons) when added to forecast 2015 Glenrock population (2,515) would not exceed the wastewater treatment systems design capacity of 5,000 persons.

Douglas

The anticipated peak construction-related population in Douglas (six persons) when added to forecast 2015 Douglas population (6,020) would not exceed the wastewater treatment systems design capacity of 15,000 persons.

Casper

The anticipated peak construction-related population in Casper (96 persons) when added to forecast 2015 Casper population (56,822) would not exceed the Sam Hobbs Regional Wastewater Treatment Facility remaining design capacity of 48 percent.

Operations Impact

The small incremental population associated with PWP I and PWP II operations would have no appreciable effect on the sewer collection and treatment facilities in any of the primarily affected local governments, even when added to forecast population growth from other sources.

5.4.5.6 Water Treatment, Storage and Distribution

Three municipal water systems are anticipated to be minimally affected by the two proposed Projects: the Glenrock and Douglas Systems in Converse County and the Casper system in Natrona County.

Table 5-27 displays information about those systems including total system capacity, peak daily usage and available capacity.

Glenrock

The Glenrock water treatment system was originally designed to accommodate 5,000 residents. The production capacity of the water sources could serve substantially larger population, but would require a modification of the town's current water supply permit. Currently, the town could add another 500 people to the system without expansion (Andrews 2004 and 2010).

Douglas

The Douglas water system was designed to accommodate 10,000 residents (Sweeney 2004). Douglas' 2009 population was estimated to be 6,202.

Casper

The Casper municipal water system receives its water from the Central Wyoming Regional Water System (CWRWS), managed by a Joint Powers Board that includes representatives from the Casper and other Natrona County local governments (CWRWS 2010). The CWRWS obtains water from a series of wells, augmented by water pumped from the North Platte River during periods of peak summer demand (Gollnitz, et. al, 2006). While normally adequate to accommodate existing demand with some unused capacity, periods of peak flow on the North Platte River have resulted in periods when the wellfields could not be used, and the subsequent drop in stored water resulted in lawn watering restrictions (CST 2010).

Table 5-27 Affected Municipal Water System Capacities, Usage, and Available Capacity.

Municipality	Population Served	Total System Capacity (gpd)	Treated Water Storage Capacity (gpd)	Peak Daily Usage	Available Total Capacity	Available Storage Capacity
Glenrock	2,500	1,700,000	1,750,000	1,400,000	17.65%	20.00%
Douglas	5,800	5,168,000	6,075,000	3,795,095	26.57%	37.53%
Casper	57,000	42,000,000	26,000,000	26,000,000	38.10%	0.00%

Sources: WWDC 2009a & b.

Construction Impacts

Because construction-related populations would occupy existing housing resources, which are already served by water distribution systems, the two Projects' construction-related demand would not affect any water distribution systems.

Glenrock

The anticipated peak construction-related population in Glenrock (23 persons) when added to forecast 2015 Glenrock population (2,515) would not exceed the current water system capacity of 3,000 persons.

Douglas

The anticipated peak construction-related population in Douglas (six persons) when added to forecast 2015 Douglas population (6,020) would not exceed the water system's design capacity of 10,000 persons.

Casper

The anticipated peak construction-related population in Casper (96 persons) when added to forecast 2015 Casper population (56,822) would not exceed the water system's remaining 38 percent capacity.

Operations Impacts

The small incremental population associated with the two Projects' operations would have no appreciable effect on the water system capacities of any of the primarily affected local governments, even when added to population growth from other sources.

5.4.5.7 Solid Waste Collection and Disposal

The Projects would affect solid waste disposal systems in two ways. Construction waste and a limited amount of municipal solid waste (MSW) would be generated on the project sites during construction, and construction and operations workers would generate municipal solid waste in the communities where they live while working on the Projects.

All Natrona County municipalities and the Converse County municipalities of Glenrock and Douglas transport their MSW to the Casper Regional Landfill (CRL) for disposal. The City of Casper is permitted to operate the CRL on a 1,750 acre site. Phase I of the CRL includes 88 acres and has an estimated capacity of 11,920,000 cubic yards and a lifespan of 50 years. Five future cells also have estimated life spans of 50 years (Inberg-Miller Engineers 2009). MSW is collected by a variety of municipal and private trash haulers and transported to transfer stations or hauled directly to the CRL.

The Glenrock Area Solid Waste Disposal District (GASWDD) also operates the Glenrock landfill. The GASWDD has accepted construction waste from other Glenrock area wind energy projects. WWI is in discussions with GASWDD to determine the best location for disposal of the two Projects' construction wastes.

Construction Impacts

The two Projects' waste generation is described in Section 7.1.6. The EPC contractor will prepare a construction solid waste management plan prior to the initiation of construction. Both Projects' onsite construction waste would be collected in dumpsters provided by a commercial solid waste disposal and hauling company and hauled either to the Glenrock landfill or directly to the CRL. Costs of the hauling and disposal would be borne by the construction contractor. Much of the WTG packaging materials and other construction wastes such as cable and wire spools will be separated and recycled. Construction wastes are estimated to average 15 cubic yards per turbine (Haines 2010) or a total of 930 cubic yards for both Projects (465 Cubic yards per project).

Construction workers would reside in existing housing, primarily motels and RV parks, which are presumed served currently by municipal or private solid waste collection services. These wastes would be transported to transfer stations and then to the CRL for disposal. Costs of the waste hauling and disposal would be borne by the motel or RV park, or in the case of rental housing or apartments, by the landlord or tenant, depending on the provisions of the rental agreement.

The 2008 Wyoming Statewide estimated average municipal solid waste disposal per person per day was 6.5 pounds (WDEQ SHWD 2008). Non-local construction workers are likely to average substantially less than this average (local construction workers are omitted from this calculation because they are already contributing to the solid waste disposal totals). Nevertheless, assuming the 6.5 pounds of solid

waste per day average for the non-local workers over the construction phases of the projects (an estimated 23,205 non-local construction worker days) yields and estimated solid waste impact of 188.5 cubic yards for both Projects, assuming 800 pounds of MSW per cubic yard. This would be a very small fraction of the 11.9 million cubic yard capacity of Phase 1 of the CRL. Even when added to solid waste disposal volumes associated with population growth for recommended primarily affected communities for 2015, waste disposal effects of the construction workforce would only minimally reduce the remaining capacity of the CRL.

Operations Impacts

Waste generated by the two Projects during the operations phase is described in Section 7.1.6.

A minimal amount of MSW would be generated on site during operations. This waste would be collected on site and hauled by a commercial solid waste hauler to a transfer station or to the CRL.

The total number of personnel required for operation of the two Projects is anticipated to be fewer than 10 people. Assuming 10 persons and an average of 6.5 pounds per person per day of municipal solid waste, the two Projects' operations-related population would generate about 30 cubic yards annually, an even smaller fraction of the CRL's 11.9 million cubic yard capacity.

5.4.5.8 Law Enforcement Services

Law enforcement services within the recommended Area of Site Influence are provided by the Wyoming Highway Patrol (WHP), the Converse and Natrona County Sheriff's Departments, and the Douglas, Glenrock, Casper, Evansville and Mills Police Departments. Table 5-28 displays 2009 staffing for county and municipal law enforcement agencies within the two Projects' Area of Site Influence.

Officers per one thousand residents in the area range from 2.0 in Glenrock to 3.6 in Casper, compared to 2.6 in the Mountain West Region of the US as a whole (U.S. Dept. of Justice 2010).

Table 5-28 PWP I and PWP II Area of Site Influence Law Enforcement Personnel and Index Crimes per 1,000 Population: 2009.

County/Agency	Employees			Officers per 1,000 Population	Index Crimes per Officer
	Total	Officers	Civilian		
Converse County Total	55	34	21	2.5	8.9
Sheriff	21	12	9	2.4	5.2
Douglas	23	17	6	2.7	10.9
Glenrock	11	5	6	2.0	10.6
Natrona County Total	194	162	32	2.2	19.2
Sheriff	59	47	12	3.6	5.8
Casper	110	94	16	1.7	27.8
Evansville	12	10	2	4	8.4
Mills	13	11	2	3.1	13.3

Source: Wyoming Office of Attorney General, 2010.

Construction Impacts

Construction of the proposed Projects has the potential to affect local law enforcement agencies in two areas. First, certain agencies including the WHP, the Converse and Natrona County Sheriff's Department and Glenrock and Douglas Police departments could be required to provide traffic management and accident response services to workers commuting to and from the project sites and to vehicles transporting construction materials, equipment and supplies to the PWP I and PWP II project sites. Traffic management effects would be short-term, occurring primarily during the transport of WTGs and large cranes to the site. Demand for traffic enforcement and accident response services could occur throughout the construction phases of the Projects, but state and local law enforcement experience with previous Glenrock-area wind energy construction projects has been that that such response has seldom been required (Becker 2010, Price 2010, Sellers 2010, Sweet 2010, Walsh 2010).

The Converse and Natrona County Sheriff departments and the Glenrock, Douglas, Casper and Evansville police departments could also be required to provide general law enforcement services in conjunction with the temporary residency by non-local workers in those counties and communities. Although all types of law enforcement services could be required, local law enforcement officials cite those frequently associated with construction workforces (alcohol and drug-related offenses and minor disturbances) as

most common. Representatives of the Converse County Sheriff's Department, the Casper Police Department and the Casper District of the Wyoming Highway Patrol also cite failure to register out of state vehicles as an issue on some previous wind energy construction projects (Becker 2010, Price 2010, Walsh 2010). Such registration is legally required when out-of-state workers accept gainful employment within the state. A temporary worker registration permit can be obtained in lieu of full registration, titling and licensing.

Operations Impacts

PWP I and PWP II operations and maintenance activities will involve a small workforce (six workers) and associated commuting to and from the project areas. Occasional maintenance activities will involve small numbers of contractors and vendors from time to time. These activities would be short-term in nature. The incremental operations-related population is anticipated to be less than ten people. The effects of PWP I and PWP II operations and maintenance activities, workforce and population on law enforcement agencies within the recommended Area of Site Influence would be minimal.

5.4.5.9 Fire Protection and Emergency Response Services

As with law enforcement, certain fire protection and emergency response agencies would potentially provide fire suppression and accident response services on the two project sites, in communities where employees of the Projects live, and along transportation routes that would provide access for materials, equipment and supplies and workforce commuting.

The Converse and Natrona County Emergency Management Agency coordinates emergency response, disaster planning and Homeland Security activities in Converse and Natrona counties. The Converse County Emergency Management Agency has experienced little demand from previous Glenrock-area wind energy projects (Dalgarn 2010).

Table 5-29 below displays the fire suppression agencies within the two Projects' recommended area of site influence, along with information about agency staffing.

Table 5-29 Fire Protection Agencies within the two Projects' Recommended Area of Site Influence.

		Number of Fire Fighters		EMS Services		
	Number of Stations	Full-Time Paid	Volunteer	EMS Services	Basic EMTs	Advanced EMTs
Converse County						
Converse County Rural Fire Control Association	1	0	105	No	0	0
Dave Johnston Power Plant Fire Brigade	1	0	46	Yes	3	2
Douglas Volunteer Fire Department	1	0	45	Yes	14	2
Glenrock/Converse County Volunteer Fire Department	1	0	42	No	3	0
Converse County Total	4	0	193	0 [No or Yes?]	6	2
Natrona County						
Bar Nunn Volunteer Fire Department	1	0	21	Yes	11	0
Casper Fire Department	5	76	0	Yes	71	38
Casper Mountain Fire Department	1	0	86	No	0	0
Evansville Fire Department	1	0	50	Yes	30	5
Mills Volunteer Fire Department	1	6	14	Yes	8	9
Natrona County Fire Protection District	2	21	0	Yes	14	6
Natrona County International Airport Fire Department	1	8.5	0	N	1	0
Salt Creek Emergency Services Stations 16 and 17	1	0	21	Yes	12	0
Natrona County Total	13	111.5	192	0	147	58
Recommended Area of Site Influence Total	17	111.5	385	0	153	60

Source: Wyoming State Fire Marshall, 2010.

Converse County Fire protection agencies are exclusively staffed by volunteers. The Natrona County Fire Protection District, Casper Fire Department and Natrona County International Airport Fire Department have paid staff only. Other Natrona County protection agencies are staffed by a combination of paid staff and volunteers.

The PWP I and PWP II project sites are located within Zone 6 of the Converse County Rural Fire Control Association (CCRFCA). The CCRFCA would provide first response services to fires at the project sites. The Zone 6 fire warden is one of the Projects' landowners and lives near the site. There are seven CCRFCA volunteers in the immediate area of the project sites. CCRFCA fire suppression equipment staged at ranches near the Projects includes:

- 1 Military surplus 6 x 6 with an 800 gallon tank and foaming capability on the Rick Grant Ranch;
- 3 Military surplus M37 Fast Attack vehicles, each with a 200 gallon tank on the Turtle Rock Ranch;
- 2, 6 x 6 water tankers and 1 Fast Attack vehicle on a location on Box Elder Road, several miles from the project sites;
- 1 Fast Attack vehicle on the William Grant Ranch; and,
- A seasonally deployed water-drop-capable Wyoming State Forestry Department helicopter, fuel truck, pilot and crew located on the Duncan Ranch.

If needed, backup would be provided by other CCRFCA zones or the Glenrock/Converse County Volunteer Fire Department (G/CCVFD). The G/CCVFD would also respond to fires and emergencies on portions of the Mormon Canyon and Box Elder Road access routes to the Projects. The Douglas Volunteer Fire Department and the CCRFCA would respond to emergencies on the Sunflower Trail/Cold Springs/Windy Ridge access route.

Ambulance response for medical emergencies occurring on the two project sites and along access routes would be provided by Memorial Hospital of Converse County's Ambulance Service. The Glenrock Ambulance station has two ambulances, two paramedics, two EMT-intermediate staff, two EMT basic staff and three nurses. Staff is called via pagers. Typical response times are 6.5 to 7 minutes from page to en route.

Three ambulance units are stationed in Douglas at MHCC along with a staff crew and a back-up crew. Douglas staff includes seven paramedics, eight EMT-intermediate staff and three EMT-basic staff.

Average response times in Douglas are two minutes from the initial page to en route (Dalgarn 2010, Johnson 2010).

In the event of serious injuries on the PWP I and/or PWP II project sites or along the access routes, the injured may be air evacuated via helicopter using Life Flight dispatched from the Wyoming Medical Center in Casper.

Construction Impacts

Fire suppression and emergency response services would be provided on an as needed basis during the six-month construction periods in both 2011 and 2012. It is important to note that the two Projects' EPC contractor will prepare a site-specific safety plan for the two Projects. Portable fire extinguishers will be located on all equipment, trailers, and fueling stations. All EPC employees will have Red Cross first aid training and each major subcontractor will be required to have at least two first aid trained employees. The EPC and all subcontractors working on elevated WTGs will have a rescue plan and workers trained in high-angle, confined space rescue. The latter would eliminate the need for either fire suppression agencies or MHCC ambulance staff to ascend towers to rescue and treat injured persons.

Also, as noted in Section 7.1.6 of this application, WWI intends to cooperate with the affected law enforcement, fire suppression and emergency response agencies to prepare a mutually agreed upon Emergency Response Plan for construction and operations of PWP I and PWP II. Table 4.2 in Section 4 of this application lists contacts with local emergency response agencies.

The experience with other Converse County wind energy projects has been that few emergencies required response from either local fire suppression agencies or emergency medical and ambulance providers. While unforeseen emergencies can arise during any construction project, the combination of EPC contractor fire suppression and emergency management response capabilities, the preparation and implementation of an Emergency Response Plan and current capabilities of local emergency management, fire suppression and emergency medical service agencies, coupled with the relatively small size and duration of both projects should allow emergency response incidents to be addressed within the existing capabilities of the affected agencies.

Operations Impacts

The small size of the work force and type of on-site activity associated with operation and maintenance of the two Projects would correspondingly result in limited potential for commuting and industrial accidents. Consequently, the effects of the two Projects' operations and maintenance activities on fire suppression and emergency response agencies within the recommended Area of Site Influence are likely to be minimal.

5.4.5.10 Health and Hospital Care Facilities and Services

Two hospitals and one general health care facility are located within the recommended Area of Site Influence of the two Projects and have the potential to be directly affected:

- The Glenrock Hospital District's Glenrock Clinic,
- Memorial Hospital of Converse County located in Douglas, and,
- Wyoming Medical Center located in Casper.

Other specialized medical clinics and practices located in Casper and Douglas may see some workers employed by the two Projects, but the demands would be temporary and not support changes in staffing or services provided.

Glenrock Clinic

The Glenrock Clinic has ten full-time employees including two physician assistants, two registered nurses, three administrative staff, one lab/X-ray technician, one custodian/maintenance staff, and a clinic administrator. There are also two part-time employees, a housekeeper and a transcription technician. The physician staff includes five doctors from the Wyoming Medical Center who are on-site on a rotating basis. The Glenrock Clinic only provides outpatient services - there are no inpatient beds. Minor to moderate injuries are stabilized and transferred to an inpatient facility if needed (Cielinski 2010).

Memorial Hospital of Converse County

MHCC is a 25-bed critical access, acute care hospital with two ICU beds, two labor/post-partum suites, and four nursery cradles. All other rooms are semi-private. All attending physicians at MHCC are board

certified. During the summer of 2010, MHCC had four family practitioners, three internists, one nurse practitioner, one podiatrist, one OB/GYN physician and two general surgeons. The hospital was recruiting another family practice physician and an internist. MHCC also contracts with one radiologist, and two orthopedic surgeons. Recent MHCC occupancy has been 68 percent (WDH 2010).

The MHCC Health Clinic, co-located with the hospital, is staffed full-time with one physician assistant under the supervision of a family practitioner that travels one day every other week; the OB/GYN physician sees patients at the clinic one day every other week (Nordwick 2010).

Wyoming Medical Center

WMC is a Joint Commission Accredited regional medical center and Level 2 Trauma Center with over 200 beds and 150 attending physicians. WMC offers a complete range of health care services including 50 health care specialties, complete emergency facilities, surgical accommodations and rehabilitative services. It operates two Centers of Excellence: the Heart Center of Wyoming and the Wyoming Neuroscience and Spine Institute (WMC 2010). WMC further provides a Life Flight helicopter and airplane services. Additionally, Casper has two urgent care facilities and a private, physician owned hospital, Mountain View Regional Hospital, which offers pain management, orthopedic surgery, plastic surgery, general surgery, bariatric surgery and ear, nose and throat surgery and medical imaging services (MVRH 2011).

Construction Impacts

Locally hired construction workers are assumed to be currently using health care services within the Recommended Area of Site Influence and would therefore not generate incremental demand for health care services. Given that non-local PWP I and PWP II construction employees will be in the area temporarily, for six months or less, most employees will only seek emergency and urgent health care while employed on the Projects. Construction employees are likely to seek routine health care services from their own physicians in their hometowns.

Because non-local construction workers would not have relationships with physicians in Converse and Natrona counties, they are more likely to use hospital emergency rooms for urgent but non-emergency needs. The presence of the Glenrock Clinic and several urgent health care facilities in Casper is likely to

reduce non-local construction worker use of emergency rooms for non-emergencies. The two Projects' construction management contractor will provide health insurance for its employees and many subcontractors will also provide health care insurance.

Given that the non-local construction worker peak would be an estimated 118 workers, non-local construction worker demand for health care services should not be a burden for the Glenrock Clinic, MHCC, WMC or other health care providers within the Recommended Area of Site Influence.

Operations Impacts

An estimated incremental population of six people would be associated PWP I and PWP II operations. This would be a small fraction of existing and forecast populations through 2015 for any community within the recommended Area of Site Influence and would therefore not result in undue burden for health care services and facilities.

5.4.5.11 Human Services

The Wyoming Department of Family Services offers human services in four main program areas: Public Assistance (nutrition support and home heating help), Child Support Enforcement, Juvenile Services and Protective Services. DFS offices are located in Glenrock, Douglas and Casper; the Glenrock office is staffed on a regularly scheduled basis from the Douglas office. Table 5-30 provides information about the current staffing levels in the DFS Douglas and Casper offices.

Table 5-30 Wyoming Department of Family Services Douglas and Casper Offices 2010 Staffing Levels.

Office	Public Assistance Staff *	Social Work Staff*
Douglas	2	3
Casper	19	20

* Includes Supervisors.
Source: Yaksic 2010.

Previous wind energy construction projects have not generated increases in DFS family services caseloads (Byer 2010, Maidl 2010). Most non-local wind project construction workers are in the area for a brief period and do not bring family members with them. Because non-local wind energy construction workers are working while in the project area, they typically do not qualify for public assistance, although it is not discernable from public assistance records if non-local construction workers have applied for public assistance after construction projects are completed (Fitzler 2010).

Construction Impacts

Given the relatively brief construction period (six months) for each of the two Projects, it is unlikely that construction workers will be accompanied by family members and because they will be working, they will not require public assistance. Therefore, the construction phases of PWP I and PWP II will be unlikely to generate increased service levels for human service agencies within the recommended Area of Site Influence.

Operations Impacts

Given the relatively small incremental population associated with operations and maintenance of PWP I and PWP II, increases in demand for human services within the recommended Area of Site Influence would likely be negligible.

5.4.5.12 Community and Urban Outdoor Recreation

Each of the communities likely to host a substantial portion of the non-local construction workforce offers community and outdoor recreation resources. Regional outdoor recreational resources are addressed in Section 6.13 of this application.

Glenrock

Glenrock has a total of six parks, a walking path and an outdoor recreation complex. The parks offer playgrounds, ball fields, a rodeo complex, a paintball court, playing areas, restrooms and other facilities. The Glenrock Recreation Center, operated by the Glenrock Recreation District, offers physical fitness classes, a game room, a weight room, cardiovascular equipment, a gym and a swimming pool located at

the Glenrock Middle School. The recreation center has been used by construction workers on previous wind energy projects (Stewart 2010). There is also a golf course in Glenrock.

Douglas

Douglas offers 12 parks totaling 138 acres with a variety of amenities such as playgrounds, ballfields and tennis courts as well as several miles of hiking and biking trails and a municipal water park, which is open in the summer (Douglas 2010). Converse County School District # 1 operates the Douglas Recreation Center. There is also a golf course in Douglas.

Casper

Casper offers 44 parks including 261 acres of formal turf, with over 100 acres of athletic fields and 2.5 acres of playgrounds. There are also approximately 1,000 acres of undeveloped parkland (Casper 2010). The Platte River Parkway offers hiking, bicycling and picnicking opportunities and the Casper Recreation Center offers recreation and fitness facilities and a full range of health and fitness, arts and crafts and recreation classes. Casper also offers four golf courses, swimming and ice skating facilities and alpine skiing and snowboarding at the Hogadon Ski Area on Casper Mountain. Boating, hunting, fishing and other winter and summer sports are readily accessible through drives of less than an hour.

Construction Impacts

Impacts of construction activities and populations on community and urban outdoor recreation resources within the recommended Area of Site Influence would include the use of community parks and recreation facilities by construction workers.

The relatively small and short-term construction workforce would likely have little effect on community parks and recreation facilities. The distribution of the non-local workforce at peak (23 persons in Glenrock, 6 in Douglas and 99 in the Casper area) would be a fraction of the current and anticipated population, consequently effects on park and recreation center use by construction workers would be negligible.

Operations Impacts

PWP I and PWP II operations-related incremental population of less than ten people would have little effect on community parks and recreation centers.

5.4.5.13 Educational Facilities

There are three public school districts serving the recommended Area of Site Influence: Converse County School District # 1 (CCSD#1) includes Douglas and the eastern part of Converse County, Converse County School District # 2 (CCSD#2) includes Glenrock and the western part of Converse County and Natrona County School District # 1 (NCSD#1) includes all of Natrona County. The Projects are located in CCSD#2.

As shown by Table 5-31, total school district enrollment decreased in CCSD#1 and CCSD# 2 between 1999 and 2010, except for small annual increases during 2002-2003 and 207 -2008 in CCSD#1 and 2002 and 2008 in CCSD#2. NCSD#1 total enrollment decreased between 1999 and 2007 and then began to increase.

Table 5-32 displays October 2005 through October 2009 total enrollment by grade for the three school districts. In CCSD#1, enrollment in grades K through 4 and 6 through 8 increased over the period, while enrollment in grades 9 through 12 decreased. In both CCSD#2 and NCSD#1 enrollment in grades K through 4 increased and enrollment in grades 5 through 8 and 9 through 12 decreased.

Table 5-33 displays school facilities in the three school districts. CCSD#1 has one high school, one middle school, two elementary schools and four rural schools, which serve elementary grade levels. CCSD#2 has one high school, one middle school and one elementary school. NCSD#1 has five middle schools, five high schools, 24 elementary schools and four schools that offer special programs and serve a range of grade levels.

Table 5-31 Recommended Area of Site Influence School District Enrollment (1999-2009).

Fall Enrollment by School Year*	Converse County School District 1	Converse County School District 2	Natrona County School District 1
1999	1,747	879	12,271
2000	1,715	860	12,048
2001	1,660	783	12,038
2002	1,663	792	11,835
2003	1,688	771	11,650
2004	1,582	743	11,590
2005	1,587	739	11,546
2006	1,584	713	11,408
2007	1,617	691	11,445
2008	1,755	696	11,604
2009	1,696	685	11,642
2010	1,690	688	11,743
Change (SY 1999- SY 2010)			
Numeric Change	-57	-191	-528
Percentage Change	-3.3%	-21.7%	-4.3%
Annual Growth Rate (or Rate of Decline)	-0.3%	-2.3%	-0.4%

Source: Wyoming Department of Education 2010a.
* Term begins in September of the previous year. Statistics are for October enrollment.

Table 5-32 Recommended Area of Site Influence: Total Enrollment Trends by Grade, 2005 to 2009.

Fall Enrollment Year	Total: K - 4	Total: 5 - 8	Total: 9 - 12	Total Enrollment
Converse County School District #1				
2005	547	476	561	1,584
2006	586	494	537	1,617
2007	658	521	576	1,755
2008	671	481	544	1,696
2009	645	509	536	1,690
Percent Change 2005 to 2009 for CCS # 1	17.9%	6.9%	-4.5%	6.7%
Converse County School District #2				
2005	250	232	231	713
2006	243	215	233	691
2007	254	215	227	696
2008	249	204	232	685
2009	258	217	213	688
Percent Change 2005 to 2009 for CC SD # 2	3.2%	-6.5%	-7.8%	-3.5%
Natrona County School District #1				
2005	4195	3524	3689	11,408
2006	4255	3509	3680	11,444
2007	4445	3554	3605	11,604
2008	4558	3527	3557	11,642
2009	4665	3498	3580	11,743
Percent Change 2005 to 2009 for Natrona County School District 1	11.2%	-0.7%	-3.0%	2.9%

Source: Wyoming Department of Education 2010b.

Table 5-33 School Facilities in Converse and Natrona Counties.

Elementary Schools	Middle Schools	High Schools	Other Schools
Converse County School District # 1			
Douglas Primary	Douglas Middle	Douglas High School	Dry Creek (rural)
Douglas Intermediate			Moss Agate (rural)
			Shawnee (rural)
			White (rural)
Converse County School District # 2			
Grant Elementary	Glenrock Intermediate/ Middle	Glenrock High	
Natrona County School District #1			
Alcova Elementary	Centennial Junior High	Kelly Walsh High School	ABLE (age 18-21; Transitional School)
Bar Nunn Elementary	CY Middle School	Natrona County High School	Midwest Schools (K-12)
Casper Classical Academy	Dean Morgan Junior High	Roosevelt High School	Poison Spider School (K-8)
Cottonwood Elementary	Frontier Middle School	Star Lane Center	Woods Learning Center (K-8)
Crest Hill Elementary	Fort Caspar Academy (K-6)	Transitions Learning Center	
Evansville Elementary			
Grant Elementary			
Manor Heights Elementary			
Mills Elementary			
Mountain View Elementary			
North Casper Elementary			
Oregon Trail Elementary			
Paradise Valley Elementary			
Park Elementary			
Pineview Elementary			
Powder River Elementary			
Red Creek Elementary			
Sagewood Elementary			
Southridge Elementary			
Summit Elementary School			
University Park Elementary			
Verda James Elementary			
Willard Elementary			
Willow Creek Elementary			

Sources: CCSD#1 2010, CCSD#2 2010, NCSD#1 2010.

CCSD#1 has capacity to accommodate additional students in the middle and high schools but is capacity constrained at the elementary school level and currently is using four modular units to house some students. The district intends to begin construction of a new elementary school during the summer of 2011 (Espeland 2010). CCSD#2 has capacity to accommodate additional students in all three schools. To date, CCSD#2 has not experienced increases in enrollment from either construction or operations phases of Glenrock area wind energy projects (Hughes 2010).

Construction Impacts

Non-local construction workers on previous Glenrock-area wind projects have rarely been accompanied by school age children. Previous projects have generated from one to four new students during peak construction quarters. The PWP I and PWP II construction workforce will be substantially smaller at peak than the previous Glenrock area wind energy construction projects and the duration of the construction schedule for each of the two Projects (six months) will be substantially shorter than previous projects; therefore, even fewer school age children would be likely to accompany non-local construction workers.

Any incoming PWP I and PWP II construction-related students would likely be spread over several districts, schools and grades, but even if they all attended one school, the relatively few students associated with the two Projects' construction workforce would likely have minimal effect on local educational facilities and staffing levels.

Operations Impacts

The non-local portion of the PWP I and PWP II operations and maintenance workforce, which is estimated to be three workers, would have an estimated three school age children. As with construction, these children would likely be enrolled in several districts, schools and grades, but even if all enrolled in one school, would have minimal effect on local educational facilities and staffing levels.

5.4.6 Transition from Construction to Operations

The anticipated construction workforce for the two Projects would be relatively small (a peak of 168 workers in the first segment, a peak of 144 workers in the second segment) and short-term (two segments of six months duration each). Most non-local workers would likely be housed in temporary housing

accommodations such as motels and RV parks. New housing would not be required to accommodate either the construction or the operations workforces. Local governments would not be required to add staff or services or expand facilities or otherwise change their service levels to accommodate either the construction or operations workforces for the Projects. Therefore, no problems associated with the transition from a temporary workforce to the relatively small operating workforce would be anticipated.

5.4.7 Cumulative Workforce Estimates

At the time of this assessment, no large-scale industrial projects are scheduled to be constructed within the Recommended Area of Site Influence during the period of construction of the Projects. There is current interest in exploration in the Niobrara Shale formation in Converse County, but no development forecasts are available. Local economic development agencies in Converse and Natrona counties are not aware of any major construction projects during the 2011 or 2012 period (Porter 2010, Wernsman 2010).

5.4.8 Fiscal Analysis

5.4.8.1 Existing Governmental Revenues and Finances

Ad Valorem Taxes

Ad valorem taxes, commonly known as property taxes, are derived from assessments on real and personal property. Such taxes are major sources of revenue for local governments and school districts. The state does not impose an ad valorem tax.

Ad valorem taxes levied on individual properties reflect the taxable value assessed on the property and the tax rates assessed by local entities with taxing jurisdiction in which the property is located. Property is assessed at a fractional basis of fair market or productivity value. Agricultural, commercial and residential properties are assessed at 9.5 percent of the base value. Industrial property is assessed at 11.5 percent of the base value. Minerals are assessed at 100 percent. Utilities, railroads and airlines are assessed by the state based on the contribution of assets located in Wyoming to the overall system/corporate value. Wind energy facilities are industrial property, with three different approaches considered to determine fair market value. All taxable property in Wyoming is, at a minimum, subject to taxes from the county (general fund), local school district, and levies mandated to support public

education under the Wyoming School Foundation program. Additional ad valorem tax levies may be imposed for other countywide purposes, such as support of a hospital district, a city or town, and other special districts.

Over the past decade, total assessed valuation of Converse and Natrona counties has increased dramatically, as it has on a statewide basis. The total assessed value of $693.4 million in 2010 for Converse County represents a 93 percent increase (in nominal terms) over the corresponding value in 2001. Natrona County had seen its assessed valuation more than double between 2001 and 2009, but then saw a decline of more than 20 percent between 2009 and 2010. Converse County's total valuation also dropped during that period, but by only 0.2 percent -- see Table 5-34.

At the statewide level, total assessed valuation nearly tripled over the past decade, largely reflecting increases in mineral valuation on coal, oil and natural gas. The concentration of value associated with minerals, when combined with the sharp decline in energy prices in 2009, resulted in a net decline of nearly $8 billion, or 20 percent, in statewide valuation from 2009 to 2010.

Table 5-34 Total Assessed Valuation, 2001 to 2010.

Year	Converse County	Natrona County	Wyoming
2001	$359,648,277	$578,110,019	$10,542,096,400
2002	$359,896,305	$565,937,435	$11,169,306,927
2003	$348,338,443	$483,484,057	$10,340,086,954
2004	$417,287,747	$585,496,267	$13,679,536,318
2005	$432,232,521	$753,353,114	$16,455,084,484
2006	$457,386,031	$944,105,934	$20,978,659,770
2007	$505,773,517	$1,033,439,288	$21,491,267,436
2008	$583,725,972	$1,058,629,455	$21,898,331,198
2009	$694,930,400	$1,287,928,434	$29,219,539,369
2010	$693,427,047	$1,034,571,958	$21,316,466,990
Change	93%	79%	102%

Minerals and utilities account for nearly 75 percent of the total assessed valuation in Converse County, among the highest concentrations in the state. Residential property accounts for approximately 11 percent of the counties valuation - see Table 5-35 and Figure 5-29 below. By comparison, residential property is the single largest contributor to assessed valuation in Natrona County, with 40 percent. Assessments on minerals, at $316 million and 31 percent of the total are the second largest category. Minerals and residential property are the two largest categories at the statewide level, with 59 percent and 20 percent, respectively.

Table 5-35 Assessed Valuation by Type of Property and County (2010).

	Converse County	Natrona County	Wyoming Statewide
Locally Assessed			
Agricultural Land	$10,658,980	$6,510,660	$219,341,253
Commercial Land, Improvements and Personal Property	$18,187,672	$178,185,302	$1,119,225,299
Residential Land, Improvements and Personal Property	$78,593,267	$414,908,505	$4,266,918,578
Industrial Property	$70,753,113	$71,473,766	$1,921,646,915
Centrally Assessed			
Non Minerals (Utilities, Railroads, and Airlines)	$143,388,394	$47,851,926	$1,205,519,361
Minerals	$371,845,621	$315,641,798	$12,583,815,584
Total	$693,427,047	$1,034,571,957	$21,316,466,990

Source: Wyoming Department of Revenue, 2010axx.

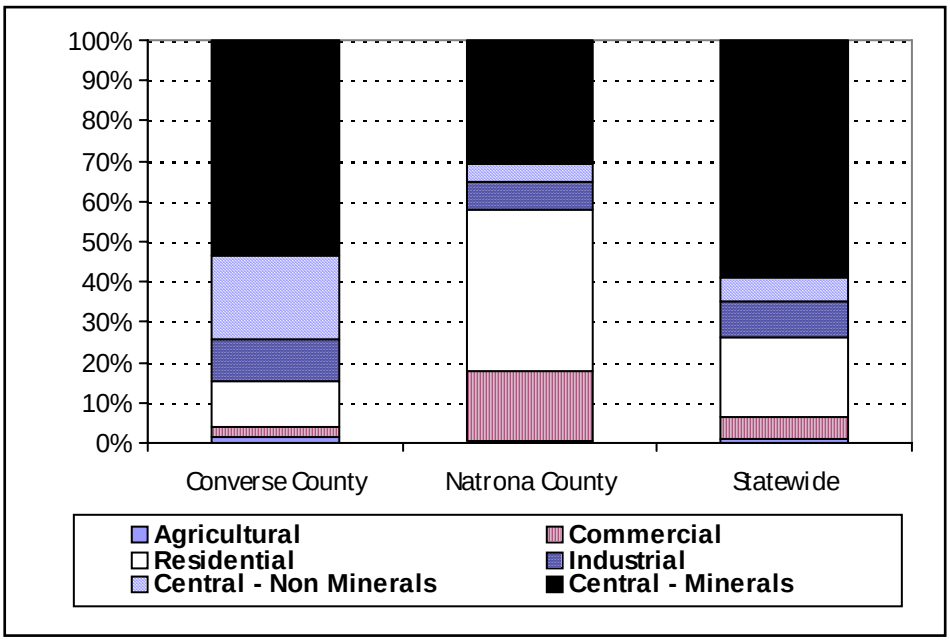


Figure 5-29 Composition of Total Assessed Valuation in the Study Area and Statewide, 2010.

Sales, Use, and Lodging Tax

Sales and use taxes are important revenue sources for the state and for local governments. The state levies a 4 percent sales and 4 percent use tax, the latter imposed on purchases made outside of the state for use in Wyoming. Revenues generated by these taxes are allocated to the state's general fund (69 percent), with the remainder (less a 1 percent administrative fee) distributed to local governments.

Local governments have an option to impose sales, use and lodging taxes. Local sales and use taxes can be levied for both general and specific purposes, the former benefiting the general fund, the latter a defined purpose. In addition, local governments can impose a lodging tax. As shown in Table 5-36 below, Converse and Natrona each impose a one percent general purpose and three percent lodging tax, but neither currently levies a specific purpose tax. Consequently, the effective tax rate on taxable purchases subject to sales and use tax is five percent, and that applied to lodging is eight percent. Note that sales and lodging taxes only apply to rentals of less than 30 days.

Table 5-36 Sales, Use and Lodging Tax Rates for 2010.

County	State Tax Rate	Local Tax Rate		Total Sales and Use Tax Rate	Lodging Tax Rate	Total Tax Rate for Lodging
		General Purpose	Specific Purpose			
Converse	4 %	1 %	No	5 %	3 %	8 %
Natrona	4 %	1 %	No	5 %	3 %	8 %

Source: Wyoming Department of Revenue, 2010.

Sales and use tax collections for a given entity across time provide a good barometer of local economic activity and differences in the level of collections between jurisdictions reflect differences in economic structure and size of the economy. Sales and use tax collections in Converse and Natrona counties, along with statewide collections, for fiscal years 2006 through 2010 are presented in Table 5-37 below, with the relative changes in sales tax receipts since 2005 illustrated in Figure 5-30. The information reveals much about recent economic trends in the area, as well as statewide.

Table 5-37 Sales and Use Tax Collections (Fiscal Years 2006-2010).

Tax Source and Location	2006	2007	2008	2009	2010
Sales Tax					
Converse County	$14,839,237	$15,066,741	$17,911,639	$23,819,787	$18,268,908
Natrona County	$88,395,192	$93,393,353	$103,055,887	$102,415,653	$82,113,512
State of Wyoming	$719,115,277	$799,254,374	$849,216,844	$863,512,486	$694,855,847
Use Tax					
Converse County	$1,798,863	$1,888,515	$2,419,868	$3,072,352	$2,605,236
Natrona County	$6,357,269	$7,493,952	$9,557,224	$9,750,220	$5,956,099
State of Wyoming	$82,158,509	$113,045,113	$124,173,967	$118,196,963	$87,147,717

Source: Wyoming Department of Administration and Information, 2010axx.

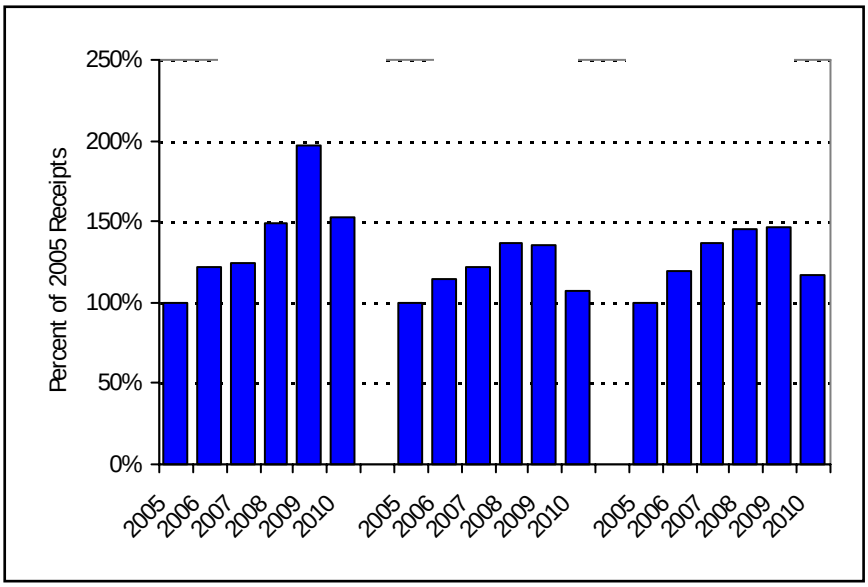


Figure 5-30 Relative Changes in Sales Tax Collections, Converse and Natrona Counties, and Statewide, 2005-2010.

In nominal terms, Converse County has registered about 2.2 percent of the statewide total sales and use tax receipts during the past 5 years; Natrona County about 11.4 percent. Natrona County's role as a regional service and trade center is reflected in the fact that sales tax receipts account for a larger portion of its combined sales and use tax receipts than in Converse County or statewide. Sales and use tax receipts fluctuate over time, reflecting differences in the level of construction and energy development activity. The latter is reflected in the economic expansion that occurred in the years immediately preceding the economic downturn and sharp decline in energy prices, as sales and use tax receipts climbed by 35 to 50 percent between 2005 and 2008. Converse County registered a further increase in 2009, with combined sales and use tax collections increasing by approximately $6.5 million, to $26.9 million. The effects of the recession are apparent in the declines in 2010 receipts--statewide receipts decreased by $200 million. The experience in Converse County was comparable, as total receipts declined by nearly $6.0 million. At the statewide level, the data reflect the effect of the economic recession on energy development as yearly use taxes receipts nearly doubled between 2005 and 2008, since falling from $124 million to $87 million.

Converse and Natrona counties each impose a three percent tax on short-term lodging. The tax applies to the costs of stays less than 30 days in length at hotels, motels, RV parks and private campgrounds. Changes in tax receipts over time may reflect trends in tourism, business travel, the level of construction

and other short-term activity that creates local demand, and changes in rates. Proceeds from this tax are used primarily to promote tourism and travel.

Annual lodging tax receipts for the past five fiscal years, illustrating the same basic pattern as described above with respect to sales and use taxes, are presented in Table 5-38. Lodging tax revenues rose substantially between 2008 and 2008, plateaued in 2009, and then declined in 2010. The vast majority of collections in Converse County emanated from Douglas, reflecting the concentration of lodging accommodations in the community. In a similar manner, the majority of lodging tax revenues in Natrona County were derived from accommodations located in Casper. However, lodging tax collections in Evansville more than doubled between 2006 and 2008, the increase corresponding with an expansion of the inventory of motel rooms in the town.

Table 5-38 Lodging Tax Collections (Fiscal Year 2003-2010).

County/Community	2006	2007	2008	2009	2010
Converse County					
Unincorporated Area	$4,553	$4,484	$7,697	$13,701	$8,024
Douglas	$130,936	$159,723	$197,526	$184,532	$141,266
Glenrock	$2,670	$3,878	$3,530	$6,300	$6,027
County Total	$138,158	$168,085	$208,753	$204,533	$155,361
Natrona County					
Unincorporated Area	$10,575	$98,071	$118,348	$96,924	$53,938
Bar Nunn	$2,740	$2,639	$0	$0	$0
Casper	$609,841	$562,380	$635,505	$827,616	$701,870
Edgerton	$4,730	$3,812	$3,818	$3,245	$1,025
Evansville	$100,098	$181,317	$251,286	$245,033	$186,192
Mills	$2,181	$8,027	$0	$0	$260
County Total	$730,165	$856,247	$1,008,958	$1,172,819	$943,285
State of Wyoming	$5,859,863	$6,843,052	$7,825,924	$8,050,481	$7,426,857

Source: Wyoming Department of Administration and Information, 2010a.

5.4.8.2 Estimated PWP I and PWP II Tax Revenues[3]

The initial capital investment in facilities and equipment, the depreciated value of that investment over time, purchases of other goods and services by PWP I, LLC and PWP II, LLC, its contractors, and households supported by the Projects would generate a series of one-time and recurrent revenues for the state and local governments. Because the projects would involve no Federal lands, Federal revenues are not estimated as part of this analysis.

The major revenue sources associated with the Projects would include local ad valorem (property) taxes on the value of the WTGs and ancillary facilities and state and local sales and use taxes on the purchases of WTGs and other taxable equipment and supplies by PWPI, LLC and PWP II, LLC, its contractors and employees. Under a state statute enacted during the 2010 legislative session, the projects will also be assessed a $1.00 per megawatt-hour of energy generated annually (W.S. 39-22-101 *et seq.*), subject to an exemption on the first three years of production. Finally, Natrona and Converse counties would also realize temporary increases in lodging taxes associated with the seasonal influx of temporary workers during the 2-season construction period.

Ad Valorem Property Taxes

Ad valorem/property taxes would accrue to Converse County and those other taxing entities in which the Projects are located. Countywide levies include the county general fund, airport, library, hospital, health care and parks and recreation funds. Levies for public education would include the state foundation program, mandatory county school levies, BOCES, and the debt service levies for Converse County School District #2. Special service districts that would benefit from property tax receipts include the weed and pest district, Glenrock Solid Waste District, and soil conservation district.

Project development costs of PWP I and PWP II are estimated at approximately $168.5 million. The total includes the costs of the WTGs, other equipment and materials, construction and erection labor and management services, off-site access improvement costs, sales and use taxes, and initial landowner lease

[3] The estimates of PWP project-related tax revenues contained in this application are based on the tax structure in place as of Dec. 31, 2010. The Wyoming Legislature is expected to consider a number of bills related to wind energy in the current session. In the event that new tax laws are enacted, PWP will prepare and submit an updated tax revenue analysis to the Council prior to the public hearing on this Application.

costs. For this analysis, the initial fair market value subject to ad valorem taxes, after netting out road improvement costs, is estimated at $164.1 million.

The proposed Projects would be located in tax district 200 in Converse County. Public entities with ad valorem taxing authority in tax district 200 include Converse County, both for its general fund and for several designated purposes, Converse County School District #2, and three special service districts. The combined overlapping tax levies in tax district 200 is 62.436 mills, the majority of which support public education - see Table 5-39 below. In addition to locally generated revenues, the district receives revenues under the statewide education equalization funding program.

Table 5-39 Ad Valorem Tax Levies for Tax District 200 in Converse County, 2010.

County General Fund and Dedicated Purpose	Tax Levy (Mills)	Percent of Total	Combined Total
County General Fund	8.614	13.8 percent	19.2 percent
County Airport	0.148	0.2 percent	
County Library	1.079	1.7 percent	
County Hospital	1.835	2.9 percent	
County Health	0.156	0.2 percent	
Parks & Recreation	0.168	0.3 percent	
Public Education			
Wyoming State Foundation	12.000	19.2 percent	74.3 percent
County Wide School	6.000	9.6 percent	
Mandated Local School	25.000	40.0 percent	
BOCES - Converse County SD#2	0.500	0.8 percent	
Recreation - Schools	1.000	1.6 percent	
Converse County SD #2 - Bond	1.772	2.8 percent	
Converse County SD #2 - Bond Interest	0.111	0.2 percent	
Special Service Districts			
Glenrock Solid Waste	2.750	4.4 percent	6.5 percent
Weed & Pest	1.000	1.6 percent	
Soil Conservation	0.303	0.5 percent	
Total Mill Levy	62.436	100.0 percent	100.0 percent

Source: Wyoming Department of Equalization 2010.

For ad valorem tax purposes, the PWP I and PWP II projects would be initially assessed at 11.5 percent of improved value. After the facilities go into production, assessments consider replacement cost, capitalized value of income, and the prices of any comparable sales. Because of the relative "youth" of the wind energy generating business, assessment practices are evolving. To date the replacement cost approach has dominated due to the scarcity of arms-length sales and the limited availability of information regarding income.

Given the dynamic status of assessment practices, ad valorem tax revenues are projected under two scenarios defining a range of likely revenues: 1) depreciated cost and 2) capitalized value of estimated income. Assessed value for the Projects would stabilize after 20 to 25 years, as ongoing maintenance, repairs and continuing production sustain the value even as the initial investment is fully depreciated. The approximate assessed valuation of the Projects using these approaches is summarized in Table 5- 40 below.

Total projected ad valorem taxes to be paid in 2012 would be approximately $661,000, based on the completed value of PWP I. Projected taxes to be paid in 2013 would range between $808,000 and $1,238,000; the range reflecting the differences associated with the two approaches as applied to the both PWP I and PWP II. From 2014 forward, the assessed value and corresponding revenues would decline steadily using the cost approach, compared to a relatively stable value under the income approach -- see Figure 5-31, below.

Table 5-40 Projected Assessed Valuation for the Projects, Selected Years.

Assessment Year (Jan. 1)	Assessed Valuation Depreciated Replacement Cost	Assessed Valuation Capitalized Income
2012	$10,594,134	$10,594,134
2013	$19,834,331	$12,944,575
2014	$19,073,569	$6,527,733
2015	$18,311,155	$6,324,593
2016	$17,546,916	$6,119,753
Stabilized - 2032	$4,900,180	$982,915

Source: WWI, BCLLC and SDLLC.

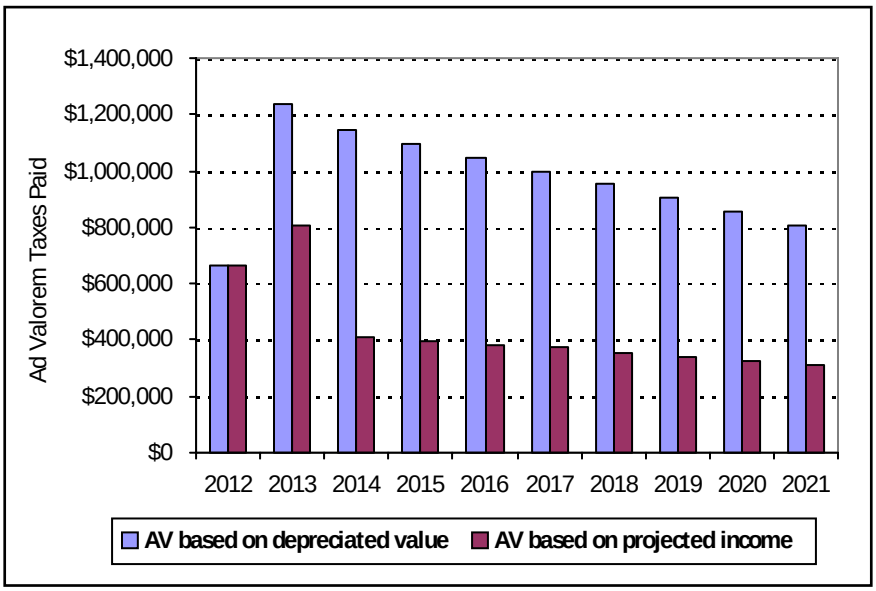


Figure 5-31 Projected Annual Ad Valorem Tax Revenues Paid by PWP I and PWP II, 2012-2021.

Over the first ten years of taxation, total ad valorem taxes to be paid on the Projects would range between $4.4 and $9.7 million, based on current tax rates. Of the total, an estimated 13.8 percent would accrue to the Converse County general fund, 5.4 percent to other county purposes, 74.3 percent to support public education, and 6.5 percent to other special districts - see Figure 5-32.

From the initiation of construction through the first 20 years of operations of PWP II, projected total ad valorem taxes to be paid on the project range from $6.6 to $16.0 million. Of the total, between $1.3 and $3.1 million would accrue to the Converse County general fund or designated countywide purpose funds.

Annual ad valorem taxes generated on the stabilized values would be in the range of $61,000 to $145,000, based on the income and cost approaches, respectively.

Due to the current statutory distribution formulas established by the legislature, the Town of Glenrock and the City of Douglas would not benefit directly in terms of ad valorem taxes generated by the Projects, but would realize limited indirect benefits based on project-related support of local businesses and public-sector spending that in turn supports local residential and commercial development that is part of the tax bases of those communities.

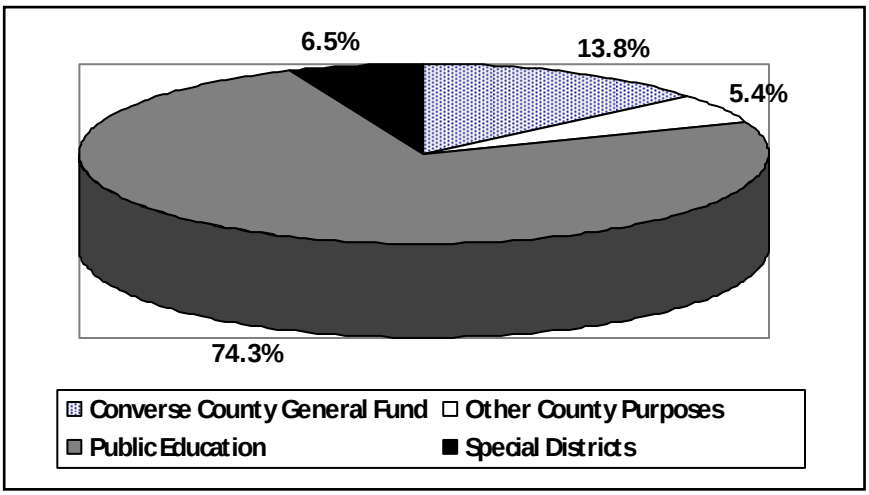


Figure 5-32 Projected Distribution of Ad Valorem Tax Revenues Paid by PWP I and PWP II, 2012-2021.

Ad valorem/property property taxes would continue over the life of the project, effectively ceasing following decommissioning and reclamation.

Sales, Use and Lodging Taxes

Construction-related Sales, Use and Lodging Taxes

Under the provisions of W.S. 39-15-105(a)(viii)(N), capital equipment and related materials and supplies used in the construction of renewable energy projects, including wind energy, are exempt from state and local sales and use taxes. That exemption will sunset effective January 1, 2012. Provided that all land leases were signed by December 31, 2009, equipment purchased for use on qualifying projects and delivered in Wyoming prior to December 31, 2011 would be eligible for the exemption. The exemption applies to equipment directly related to making a project operational and connecting a project energy collection and transmission lines with the existing power grid. The exemption does not apply to equipment or contracted services used in the construction of a project. Under the current timetable for developing PWP I and PWP II, the WTGs and other material and equipment associated with PWP I would qualify for the exemption. The WTGs and other material and equipment associated with PWP II would not be delivered prior to the sunsetting of that tax exemption.

Based on the anticipated development schedule, approximately $66.61 million of the project development cost would be subject to sales and use tax. The state sales and use tax rate of four percent would yield

total revenue of approximately $2.66 million on those expenditures, the majority of which would accrue from purchases in the 3rd quarter of 2012 in conjunction with the purchase and delivery of the WTGs – see Table 5-41 below. Of the sales and use tax proceeds initially accruing to the state, 69 percent is subsequently allocated to the general fund. The remainder, less a 1 percent administrative fee, would be distributed among local governments with a portion returned to Converse County and local municipal governments.

In addition to the local share of the state's sales and use taxes, Converse and Natrona counties would realize sales and use taxes from their respective one percent general purpose option tax on purchases subject to tax made within their respective boundaries. Total local option sales and use tax receipts from construction of the Projects are estimated at just over $666,000. The majority of such receipts would be generated from use tax levied on the purchases of the WTGs.

Table 5-41 Projected Sales and Use Tax Revenues Associated with the Projects.

	3Q - 2011	4Q - 2011	1Q/2Q - 2012	3Q - 2012	4Q - 2012	Total
Projects Direct						
Amount subject to tax (millions)				$44.62	$21.99	$66.61
State Tax	Incidental	Incidental	Incidental	$1,784,766	$879,532	$2,664,298
Local General Purpose Tax	Incidental	Incidental	Incidental	$46,191	$219,883	$666,074
Consumer Expenditures by Non-Local Workers						
State Sales Tax	$17,190	$10,044	$409	$14,301	$10,044	$51,988
Local General Purpose Tax	$4,300	$2,514	$102	$3,579	$2,514	$13,009
Total State and Local Sales and Use Tax	$21,490	$12,558	$511	$2,248,837	$1,111,973	$3,395,369

** The major project related expenditures for PWP I are anticipated to be exempt from sales and use taxes. Sales and use taxes would likely be generated by incidental purchases by PWPI, LLC and PWPW II, LLC, EPCM and subcontractors. However, the timing and amount of such revenues is uncertain.

Consumer purchases of taxable goods and services by non-local workers in the influence area would generate additional sales taxes to both the state and to local counties. A reasonable order of magnitude estimate of such revenues, assuming $30 in daily taxable expenditures per non-local worker day, would be approximately $64,000 - see Table 5-40 above.

Total sale and use tax receipts generated directly by the Projects and its work force would total $3.40 million. Construction of the Projects would also support additional local sales and use tax receipts indirectly through the "multiplier" effect on local incomes, consumer expenditures and circulation of tax revenues by government agencies. However, such revenues are not estimated as part of this analysis.

Converse and Natrona County would also realize lodging tax receipts derived from their respective three percent tax levied on short-term lodging expenditures by non-local workers during the two-season construction period. The sum and distribution of such tax revenues would depend on the following: (1) the number of non-local workers hired, (2) their choices regarding location, type of accommodations and average nightly rates, and (3) the extent to which non-local workers share accommodations. Based on the projected number of non-local workers employed during construction and allowances for housing preferences, nightly rates, and a 40 percent deduction for lodging tax exemption on rentals longer than 30 days, construction of the Projects would generate just over $1.0 million in revenues for the local lodging industry, yielding lodging tax receipts of nearly $18,500. Quarterly lodging expenditures and tax accruals are shown in Table 5-42 below. The quarterly accruals parallel the projected employment, with the 3rd quarter of each year being higher than the 4th quarter.

Table 5-42 Projected Lodging Tax Revenues Associated with the Projects.

	Q3 2011	Q4 2011	Q1/Q2 - 2012	Q3 2012	Q4 2012	Total
Est. Lodging Expenditures	$339,030	$198,074	$8,070	$282,047	$198,074	$1,025,294
Est. Lodging Tax Receipts *	$6,102	$3,566	$145	$5,077	$3,566	$18,456

Source: BCLLC and SDLLC, 2010

Operations-Related Sales Use and Lodging Taxes

State and local sales and use taxes would be generated over the life of the Projects from taxable purchases directly associated with ongoing operations and maintenance of the Projects, as well as by consumer purchases by its workers and service vendors. Although substantially lower than the revenues associated with construction, these revenues could still be substantial.

Wind Production Taxes

In 2010, Governor Freudenthal signed into law a wind energy production tax passed by the 2010 Wyoming Legislature. The tax is a $1.00 per megawatt-hour of electricity produced annually by a commercial wind project. The statutes (W.S. 39-22-101 *et seq.*) provide a three-year exemption from the date of initial production. Under the current plan of development, initial commercial production would begin in late 2011 for PWP I and late 2012 for PWP II. Given the three-year exemption, full-scale taxable production would begin in late 2014 and 2015, for PWP I and PWP II, respectively. Projected annual energy production is a function of generating capacity, efficiency and actual wind conditions. Given wind conditions in the project area, WWI foresees a potential overall capacity factor as high as 45 percent, or approximately 195,500 MWh/year for each PWP I and PWP II. Across the state, the experience of other projects suggests a minimum capacity factor of 35 percent per year, which as applied to PWP I and PWP II would translate to approximately 152,000 MWh/year for each of the two Projects. Annual wind energy production taxes associated with that production ranges between $304,000 and $390,000 - see Table 5-43. Forty percent (40 percent) of the revenues generated by this tax will accrue to the state's general fund, with 60 percent to be distributed among counties where generating facilities are located.

Table 5-43 Annual Wind Production Taxes Generated At Full Production.

Overall Annual Effective Production Rate (Percent of Rated Capacity)	State General Fund	Local Government Distribution	Total Annual Wind Production Tax
35 percent	$121,600	$182,400	$304,000
45 percent	$156,400	$234,600	$391,000

Total annual receipts accruing to the state general fund assuming full development and ten years of taxable production would range between $1,216,000 and $1,564,000. Revenues accruing to the local government distribution fund would range between $1,824,000 and $2,346,000. The distribution mechanism for the local share of these revenues has not been finalized, but it can be anticipated that a substantial share of the revenue would be distributed to the county where the power was generated, i.e., Converse County. It is, however, uncertain whether a share of the local revenue will flow through to municipalities.

Wind production taxes would continue over the life of the project, fluctuating on a year-to-year basis in response to the amount of power produced. The major public sector revenues projected in conjunction with the two Projects are summarized in Table 5-44 below.

Local governments and other public entities would realize increases in other charges for services, fees, and other taxes given the implementation of the PWP I and PWP II projects. Such revenues would be substantially lower in magnitude than those identified above, but they would still be important to the specific entity involved.

Table 5-44 Summary of Major Public Sector Revenues Generated by the PWP I and PWP II.

Revenue Source	Projected Revenue	Revenues Distributed to:
Local ad valorem/property tax (including mandatory state levies)	$808,000 to $1,238,000 (2013) $61,000 to $145,000 (year 21)	County, local and statewide public education, special service districts Glenrock, Douglas, and Casper benefit indirectly
Sales and use tax	$3.39 million during construction, higher if PWP I is delayed into 2012 Some ongoing revenues based on O&M	State general fund and local government, primarily Converse County, Douglas and Glenrock
Lodging Taxes	Approx. $18,500	Natrona and Converse counties
Wind energy production tax	$304,000 to $391,000 per year at full production	State general fund and local governments, likely to include Converse County

Total projected revenues generated by the Projects during construction and the first 10 years, derived by summing the projected tax revenues outlined above, would be between $10.7 million and $17.2 million - see Table 5.45 below. The range reflects the uncertainties associated with the future assessments for ad valorem tax purposes and the actual annual electrical output delivered to the grid. These revenues represent fiscal benefits that would accrue to public entities in conjunction with the project. Revenue accrual would continue beyond 10 years, particularly revenues derived from the wind energy tax. Increases in public expenditures would offset some of the revenues, but such expenditures would likely be minor due to the limited incremental demands on public facilities and services from the Project.

Table 5-45 Major Public Sector Revenues Generated by the Projects During Construction and the First 10 Years of Production. [1]

Tax Source	Projected Revenues (Millions)	
	Lower Estimate	Upper Estimate
Ad valorem/property tax (including mandatory state levies for education) [2]	$ 4.4	$ 10.1
Sales, use and lodging tax (assuming PWP I is tax exempt) [3]	$ 3.4	$ 3.4
Wind energy production tax [4]	$ 2.9	$ 3.7
Combined Total [5, 6]	$ 10.7	$ 17.2

Notes:

[1] Assumes construction of the two projects is staggered by one year. The 10 years of production are for PWP I, such that 9 years of production are included for PWP II.

[2] The projections are based on current tax levies and the range reflects uncertainties regarding future assessment methods for wind energy. The lower value is based on the estimated capitalized income of the project, the upper end reflects estimated depreciated value.

[3] Assumes the major capital items for PWP I and electrical substation and interconnection equipment is tax exempt under W.S. 39-15-105.

[4] The range reflects uncertainties regarding the actual future energy output delivered by the project to the grid. The lower value is based on average annual output at 35% of rated capacity, the upper value at 45% of rated capacity.

[5] The totals are irrespective of whether the revenues accrue to the state or local governments, 4 special districts, or local school districts.

[6] The values presented are thought to present reasonable “order of magnitude” estimates of project-related tax revenues, given the available cost information and tax policies in place at the end of December 2010.

Industrial Siting Impact Assistance Funds

Counties and local communities affected by the development of industrial facilities subject to Industrial Siting permit review and issuance may also qualify to receive impact assistance funds. A county (along with the designated Primarily Affected cities and towns in that county) within which the majority of construction costs are incurred by a project is automatically eligible to receive such funds, when such funds are forthcoming under Wyoming statutes. Adjoining counties and communities that are likely to experience significant social and economic impacts from construction of a facility and have not been designated as primarily affected may request a determination of eligibility to receive such funds. Impact assistance funds are generated when the construction of a project results in an increase in expected sales and use tax receipts beyond the revenues that would have been expected absent construction of the project. The increase in revenues generated by the local general purpose and special purpose option tax, if applicable, are then subject to match with additional monies from the state's share of sales and use taxes that would have been deposited to the General Fund. Such distributions are in addition to any other distributions of sales and use taxes to the county and cities and towns. The percentage shares of impact assistance distributions to the eligible local governments are established by the ISC during a public hearing held under W.S. 35-12-110.

The total distributions of impact assistance over time reflect the number and cost of projects built that are subject to ISC permitting. Over the past four fiscal years impact assistance funds totaling nearly $35.2 million have been distributed, varying between $2.2 million in fiscal year 2010 to $16.3 million in fiscal year 2009 - see Table 5-45 below. The latter was largely attributable to construction of Basin Electric's Dry Fork generating station near Gillette. Approximately 20 percent of the total impact assistance funding was derived from increased use tax receipts, the remainder on increases in sales taxes.

Campbell and Crook counties have received the bulk of the total impact assistance funds over the past four years, based on the overall level of industrial construction subject to ISA jurisdiction that occurred in the Powder River - see Table 5-46 below. Converse, Albany and Carbon counties have together received more than $3.2 million based on recent wind energy development.

Table 5-46 Total Impact Assistance Funds Distribution, Fiscal Years 2007 thru 2010.

County/Community	Sales Tax	Use Tax	Total
Albany County	176,967.91	7,836.16	184,804.07
Campbell County	19,027,734.34	5,133,569.95	24,161,304.29
Carbon County	1,108,589.05	80,905.74	1,189,494.79
Converse County	1,691,726.07	202,458.55	1,894,184.62
Crook County	4,178,182.01	1,051,466.80	5,229,648.81
Johnson County	170,200.38	57,074.20	227,274.58
Natrona County	228,723.13	15,445.96	244,169.09
Sheridan County	185,000.37	62,037.16	247,037.53
Sweetwater County	0.00	65,364.45	65,364.45
Weston County	1,301,330.67	321,743.46	1,623,074.13
Town of Douglas	65,297.61	13,329.49	78,627.10
Town of Moorcroft	26,119.04	5,531.80	31,650.84
Total	28,159,870.58	7,016,763.72	35,176,634.30

Source: Wyoming Department of Revenue, 2010. Annual Report.

Estimated Impact Assistance Payments from the Proposed Projects

Construction of PWP I and PWP II may result in the generation of impact assistance payments (IAPs) to primarily affected units of local government. Estimates of potential IAPs requires assumptions regarding the sales and use tax receipts in the 12-month period preceding the onset of construction, prevailing general economic conditions at that time, and the relative contribution that the Projects would make to statewide receipts of sales and use taxes. The latter affects the distribution of sales and use taxes made to local governments by the state of approximately 30 percent of the total statewide receipts generated by the state's four percent sales and use tax levy. A further complication arises due to the uncertainty introduced by the economic downturn and its impact on local consumer expenditures, those by the mining industry, and construction across the state as it affects estimation of the base period distribution. Yet another complication is how the results of the 2010 Census would affect future state share revenue distributions and the timing for adopting the revised allocations. Finally, how the tax-exempt status of most purchases associated with PWP I would factor into the availability of IAPs in 2011 and the establishment of the base year and estimation of IAPs for PWP II is unclear.

Given the uncertainty and other factors cited above, and the history of impact assistance payments presented in Table 5-45 above, a conservative approach seems prudent at this time. Assuming there will be no IAPs associated with PWP I, the estimated construction cost of PWP II and the current distribution of sales and use taxes to Converse County yields an order of magnitude estimate of $50,000 to $100,000 for total IAPs in 2012. However, continued economic weakness in the region that contributes to declining tax revenues during construction could effectively result in little or no IAPs being available.

Socioeconomic Assessment Conclusions

Based on the foregoing assessment, neither of the proposed Projects would pose a threat of serious injury to social and economic conditions of the current habitants or expected future inhabitants of the affected area.

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6.0 EVALUATION OF ENVIRONMENTAL IMPACTS

Potential environmental impacts associated with the construction, operation, and maintenance of the proposed Projects are presented in this section. Information on natural and cultural resources were obtained from existing data sources and field surveys conducted for the Projects. Impact analyses were conducted to evaluate the short-term, construction-related and long-term operational effects of the Projects on the surrounding environment. Avoidance and minimization of environmental impacts have been incorporated into the timing of construction activities and the proposed layout of WTGs, access roads, and appurtenant facilities. Additional means of avoiding, minimizing, and mitigating environmental impacts are described in Chapter 7.

The recommended area of site influence for assessing environmental impacts varies somewhat by resource, and study areas therefore vary by resource. For most environmental resources, the area of analysis for assessing Project-related impacts is the Pioneer Study Area Boundary (study area) identified in the project location and site plan maps provided in Appendix A. However, the study area for scenic resources extends 10 miles outward from the proposed WTG arrays. In contrast, vegetation and wildlife surveys have been confined to a much smaller portion of the study area, focusing on the PWP I and PWP II project sites, a reference site, and the transmission line corridor. Cultural resource field studies were also limited, focusing on specific blocks of land with potential to be impacted by proposed WTG arrays, access roads, and other facilities. Maps pertaining to many of the environmental resources discussed below can be found in Appendix F. Note that the recommended area of site influence and associated study area for environmental resources is far more localized than that used to assess the two Projects' effects on socioeconomic resources described in Chapter 5.

6.1 PHYSICAL, CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL DISCHARGES

There are no anticipated physical, biological, or radiological discharges associated with construction or operation of the Projects that would pose a threat of serious injury to the environment or substantially impair the health, safety, or welfare of any present or expected inhabitants in the affected areas.

6.2 AIR QUALITY

6.2.1 Regulatory Jurisdiction

The Wyoming Department of Environmental Quality (WEDQ) - Air Quality Division (AQD) implements adopted air quality standards and regulations. Air emissions associated with construction and operations of the Projects are subject to the Wyoming Air Quality Standards and Regulations (WAQSR) promulgated under the *Wyoming Environmental Quality Act* (W.S. § 35-11-101 *et seq.*). Particularly, Chapter 6 of the WAQSR establishes permitting requirements for all sources being constructed or operating in the State of Wyoming. In addition, fugitive dust is a regulated source pollutant under WAQSR Chapter 3, Section 2 (f)(i)(A).

6.2.2 Area of Site Influence

Because the only emissions associated with construction and operation of the proposed Projects would be fugitive dust and limited particulates, the recommended area of site influence for the two Projects' effects on air quality is likely limited to the Mormon Canyon Road corridor from I-25 south through the project sites and the project study area boundary (shown in Map A-2) and its immediate surroundings.

6.2.3 Construction Emission Sources and Impacts

6.2.3.1 Construction Emission Sources

Fugitive Dust - Fugitive dust is a type of particulate matter consisting of very small solid and liquid particles which become suspended in the air by the wind and human activities. Fugitive dust arises primarily from the soil and is not emitted from stacks, chimneys, or vents. Fugitive dust emissions are highly variable and depend on the type of soil, its moisture content, wind, and the type and intensity of disturbance activity.

Particulate Matter - In addition to fugitive dust, particulate matter with potential to be emitted during construction of the proposed Projects includes primarily cement dust but may also include some aggregate, sand dust, and metal emissions. The main source of these emissions would be from the transfer of cement and pozzolan material to silos, though they are typically vented through a fabric filter.

Each turbine will be supported by a reinforced and poured spread-foot concrete foundation. The concrete for the foundations will be mixed onsite by a portable batch plant. The 31 WTG foundations in each Project will require an average of 350 cubic yards of concrete per tower. Additional concrete will be needed for project substation foundations, transformer pads, and other equipment, which will also be mixed by the onsite batch plant.

Aggregate, sand, cement, water, and other raw materials will be delivered to the batch plant by truck for onsite concrete production. It is expected that water and aggregate will be obtained on the property of participating landowners to minimize hauling distances and the amount of offsite traffic. Raw materials used in concrete production will be stored in temporary silos on site and combined in appropriate proportions based on the required concrete mix design for each foundation or pad. The concrete will be placed in trucks and continuously mixed on the way to the turbine, foundation, or pad site where it will be poured into the appropriate forms.

6.2.3.2 Construction Impacts

Fugitive Dust - Fugitive dust will be generated directly from construction activities. Construction activities that have been identified as having potential for generating fugitive dust are:

- Vehicle and motorized equipment movement on paved and unpaved access roads,
- Vegetation clearing, grubbing, and grading,
- Trenching and backfilling,
- Material loading, hauling, and unloading,
- Use of material storage piles,
- Use of parking, staging and storage areas

Particulate emission factors for concrete batching are detailed in Table 6-1 and are expressed in pounds of pollutant per cubic yard of concrete. Particulate emissions associated with the mixing and transport of concrete are typically minor. Construction of the Projects would result in minimal impacts to air quality from fugitive dust and particulates. Consequently, it would not represent a substantial impairment of health, safety, or welfare of the present or expected inhabitants of the Project areas or the regional airshed.

Table 6-1 Estimated Emissions per cubic Yard of Truck-Mix Concrete.

Component	Total Particulate Matter (lb/yd^3)	Fine Particulate Matter (lb/yd^3)
Aggregate Delivery to Storage Area	0.0064	0.0031
Sand delivery to ground storage	0.0015	0.0007
Aggregate transfer to conveyer belt	0.0064	0.0031
Sand transfer to conveyer	0.0015	0.0007
Aggregate transfer to elevated storage	0.0064	0.0031
Sand transfer to elevated storage	0.0015	0.0007
Cement delivery to silo	0.0002	0.0001
Cement supplement delivery to silo	0.0003	0.0002
Weigh hopper loading	0.0079	0.0038
Mixer Truck Loading	0.0346	0.0096
Total dust emissions per yard of concrete	0.0716	0.0275
Total dust emissions for project concrete (35,000 yd^3)	2,506	963

Source: EPA, 2006.

6.2.4 Operation Emissions Sources and Impacts

6.2.4.1 Operation Emissions Sources

The sources of pollutants during the operation of the two Projects would largely be limited to the fugitive dust emission resulting from O&M vehicles using unpaved access roads. These emissions would be minor compared with the level of activity that would be required to exceed emissions thresholds. Thus, these emissions have not been quantified. No air emissions will be generated from operation of the WTGs nor the collector and interconnection substations.

6.2.4.2 Operation Impacts

The operation of the WTGs will have negligible effects on air quality (i.e., no visible plumes, fogging, misting, icing, impairment of visibility, or changes in ambient pollutant levels). Any fugitive dust generated from operation of staff vehicles traveling within the project areas would be minimal and would not represent a substantial impairment of health, safety, or welfare of the present or future inhabitants in the Project areas or the area of site influence.

6.3 NOISE

Noise is generally defined as unwanted sound. Existing sources of noise in the immediate vicinity of the study area include: traffic on Interstate 25 (likely only discernible from the very northern portion of the study area near the proposed interconnection substation) and Mormon Canyon Road; ranching and rock quarrying activities; and overhead aircraft.

6.3.1 Regulatory Jurisdiction

Between 1972 and 1982, the EPA's Office of Noise Abatement and Control coordinated all federal noise control activities. In 1981, the Reagan Administration determined that noise issues were best handled at the state and local government levels. Consequently, the EPA phased out funding for this office in 1982 in an effort to shift the primary responsibility to state and local governments. Although essentially unfunded, the Noise Control Act of 1972 and the Quite Communities Act of 1978 have not been rescinded by Congress and remain in effect today.

The implementing rules and regulations of the ISA identify noise as a component of the environment. Project-related effects on ambient noise must therefore be considered in the permit application process. As of this time, no numeric noise standards have been created at the state level or within Converse County.

6.3.2 Area of Site Influence

The area of site influence for noise evaluations consists of the proposed turbine arrays and surrounding areas that would be subject to increased sound levels as a result of the construction and operation of the two Projects.

6.3.3 Characteristics of Sound

There are several methods to measure sound, which is dependent on the source of the sound, the receiver, and the measurement objectives. Table 6-2 summarizes the technical terms related to sound that are used in this report.

Table 6-2 Definitions of Relevant Acoustical Terms.

Term	Definitions
Ambient Noise Level	The composite of all sounds near and far. The existing or baseline level of environmental noise at a given location.
Decibel (dB)	A logarithmic unit of measure commonly used in acoustics to quantify sound levels relative to reference level of 0 dB (defined as a sound pressure level of .0002 microbar) set at the typical threshold of human hearing.
A-weighted sound pressure level (dBA)	The sound pressure level in decibels using the A-weighted filter network, which is designed to approximate the human ear's response to sound. All sound levels reported in this permit application are A-weighted.

Table 6-3 shows the relative A-weighted sound levels of common sounds measured in the environment and in industry.

Table 6-3 Typical Sound Pressure Levels Measured in the Environment and Industry.

Noise Source at a Given Distance	A-Weighted Sound Level (dBA)	Qualitative Description
Aircraft Carrier Deck Jet Operation	140	
	130	Pain Threshold
Jet Takeoff (200 feet [ft])	120	
Auto Horn (3 ft)	110	Maximum Vocal Effort
Jet Takeoff (2,000 ft)	100	
New York Subway Station	90	Very Annoying, Hearing Damage (8-hour continuous exposure)
Heavy Truck (50 ft)	90	
Pneumatic Drill (50 ft)	80	Annoying
Freight Train (50 ft)	70	Intrusive; Telephone Use Difficult
Freeway Traffic (50 ft)	70	
Air Conditioning Unit (20ft)	60	
Light Auto Traffic (50 ft)	50	Quiet
Living Room or Bedroom	40	
Library	30	Very Quiet
Soft Whisper (5 ft)	30	
Broadcasting Studio	20	Empty Recording Studio
	10	Just Audible

Source: Adapted from Table E in (New York Department of Environmental Conservation 2001).

6.3.4 Construction Impacts

The EPA Office of Noise Abatement and Control studied noise from individual pieces of construction equipment, as well as from construction sites for power plants and other types of facilities. Noise from construction equipment is shown in Table 6-4. Specific information about types, quantities, and operating schedules of the two Projects' construction equipment is not available at this time, therefore data from the Federal Highway Administration (FHWA) document for industrial projects has been used to show the levels of noise that can generally be expected from the types of equipment used to construct the Projects.

Table 6-4 Average Noise Levels from Common Construction Equipment at a Distance of 50 feet.

Construction Equipment	Average Noise Level at 50 ft (dBA)*
Air Compressor	78
Backhoe	78
Concrete Mixer Truck	79
Concrete Pump Truck	81
Crane, mobile	81
Dozer	82
Generator	81
Grader	85*
Loader	79
Paver	77
Pile driver	101
Pneumatic tool	85
Pump	81
Rock drill	81
Chain Saw	84
Scraper	84
Clam Shovel	87
Dump Truck	76

* Actual measurements N/A, level based on FHWA Noise Specification 721.560.
Source: FHWA 2006.

Table 6-5 shows the total composite noise level at a reference distance of 50 ft, based on the pieces of equipment operating for each construction phase and the typical usage factor for each piece. The calculated level at 1,500 ft is probably conservative because the only attenuating mechanism considered was geometric spreading, which results in an attenuation of 6 dBA per doubling of distance; attenuation related to the presence of structures, trees or vegetation, ground effects, and terrain was not considered.

Table 6-5 Composite Construction Site Noise Level.

Construction Phase	Composite Equipment Noise Level at 50 ft (dBA)	Composite Equipment Noise Level at 1,500 ft (dBA)
Clearing	88	58
Excavation	90	60
Foundation	89	59
Erection	84	54
Finishing	89	59

Source: (U.S. Environmental Protection Agency 1971).

The Projects' major construction activities are temporary and generally limited to daytime hours. The distance from the construction site to the nearest non-participating resident is approximately 0.9 miles. Therefore, based upon the information provided in the Tables referenced above, sound levels resulting from construction of the Projects will not significantly impair the environment nor the health and safety of area residents.

6.3.5 Operation Impacts

Noise generated by the proposed Projects was modeled using *WindPRO* (version 2.7.481), a spatially explicit software package for siting wind energy facilities. The sound propagation factors used in the model have been adopted from ISO 9613-2, Acoustics - Sound Attenuation During Propagation Outdoors, Part 2: General Method of Calculation (International Organization for Standardization 1993a). A standard value of 1.9dB/km was used to approximate absorption of sound by the atmosphere. Ground attenuation was set at zero, meaning that model assumed that the turbines were located on a smooth surface. In reality, native vegetation and topography of the site would absorb sound and dampen noise levels. A penalty for pure and impulse tones is added to the WTG source noise, despite the fact that

modern wind turbines rarely emit pure tones. Thus, the model approximates a worst-case scenario for noise generation.

Each wind turbine was considered to be a point source of noise at the hub height with an overall sound power level of 106 dBA at a wind speed of 22.4 mph (10 m/s). This sound power level represents the noise level of the turbine when it is operating at 95% of its rated power.

The expected sound levels resulting from the proposed turbine layout are depicted in the Noise Map (Appendix F, Map F-1). With all of the turbines operating at a wind speed of 22.4 mph, the predicted sound level outside of the closest participating landowner residence is 43 dBA and outside of the closest non-participating landowner residence, it is 40 dBA. Therefore, the sound levels would be less inside of the residence. Such levels would likely be unnoticeable at these residences. As indicated in Map F-1, the anticipated noise level decreases with increasing distance from the Projects. Under calmer turbine wind conditions, the turbines emit less noise and the expected levels would be less than those described above or depicted on the map. Under higher wind conditions, much of the sound emitted by the turbines would be drowned out by the noise created by the wind itself.

6.4 GEOLOGY AND SOILS

Geologic and soils data were reviewed from openly available government documents, publications and internet databases produced by the Wyoming State Geological Survey, the United States Geological Survey, and the Natural Resources Conservation Service. Existing information on bedrock lithology, surficial lithology, soil characteristics, and hazards (earthquake, landslides, mining, and oil/gas) was available for much of the project areas. This information was supplemented with the results of a preliminary geotechnical investigation carried out on the proposed PWP I and PWP II project sites.

The preliminary geotechnical investigation revealed basic information about site-specific bedrock and surficial lithologic characteristics as well as soil data. The investigation also revealed basic subsurface conditions. This investigation included conducting soil borings at numerous areas within the project areas and laboratory testing of soils and rock. This information was used in the preliminary design of crane pads, foundations and access roads within the PWP I and PWP II project sites.

The following subsection presents a general overview of the geologic setting of the study area, its soil characteristics, and geologic hazards. Following this overview, potential project-related impacts are assessed. Mitigation measures to avoid or minimize potential impacts are also discussed.

6.4.1 Regulatory Jurisdiction

ISA implementing rules and regulations define the term environment as the physical conditions existing within the proposed project area including, but not limited to, land, water, minerals, and other resources over which the ISC has jurisdiction. Geology and soils comprise key physical attributes of the environment within the project areas. Regulatory jurisdiction over geology and soils is indirect and relates primarily to fossils (on public lands), soil erosion and its effects on water quality.

6.4.2 Area of Site Influence

The area of site influence is defined for geology and soil resources as the project study area boundary and all leased lands within it.

6.4.3 Geologic Setting

The study area boundary lies within the southern section of the Great Plains physiographic province (within the North Platte River Basin), near the border of the northern arm of the Southern Rocky Mountains physiographic province. The Upper Miocene Ogallala Formation and the Archean granites of the Laramie Batholith underlie the majority of the study area with 11 other minor rock formations within the project boundary.

6.4.3.1 Bedrock

The bedrock geology of the Project sites was determined using the United States Geologic Survey geologic map of the Douglas quadrangle (McLaughlin and Ploeg 2007). Map 2 in Appendix F depicts bedrock geology within the study area. There are 13 bedrock units (not including Quaternary surficial units) ranging in age from Archean to Upper Miocene within the site area. Of these 13 units, four make up the vast majority of the project areas: Archean granite, Madison Limestone, the Casper Formation, and

the Ogallala Formation. These four geologic units would be the only units in which turbine foundations would be constructed and are the only ones described below.

Archean granites of the Laramie Batholith (symbol Ag on Map F-2 in Appendix F) are described as massive, leucrocratic, pinkish-red to bright-red medium-grained, nonfoliated granite with a profusion of feldspar-rich pegmatites, some quartz veins, and numerous amphibolites and diabase dikes.

The Madison Limestone and Cambrian rocks undivided (see symbol MCmf) is described as alternating units of light-tan to gray cherty limestone and dolomite. The upper part is bluish-gray limestone with karst surface at the top. The Lower part is mainly dolomite and dolomite limestone. The entire formation is fossiliferous; spiriferiod brachiopods and solitary tetracorals being the most common.

The Lower Permian and Upper/Middle Pennsylvanian (symbol PlPc on Map F-2) is described as alternating thicker red and white sandstone and thinner gray to pink, hard, persistent limestone, with red shale and siltstone. The sandstone is highly cross-bedded with festoon cross-bedding common. The limestone is fossiliferous with brachiopods and fusulinids.

The Upper Miocene Ogallala Formation (symbol To on Map 2 in Appendix F) is described as fine-to coarse-grained light to greenish-, yellowish-, and orange-grey sandstone interbedded and interfingered in the upper part with conglomerate, claystone, and freshwater limestone; white to dark-gray vitric tuff beds near the top. The lower part has hard “pipy” calcareous beds near the top.

6.4.3.2 Surficial Lithology

Surficial geology of the study area is shown in Appendix F, Map F-3. Surficial geologic units (not including soils) underlying proposed Project facilities include Quaternary colluvium (symbol 1202 on Map F-3), Quaternary slope wash (symbol 1102), and Quaternary residuum (symbol 1402).

Quaternary colluvium is clay, silt, sand and gravel deposited along intermediate streams including slope wash and smaller alluvial fans deposited during the coalescence of alluvial fans with the youngest lower-level terrace deposits. Quaternary slope wash consists of deposits of pebbles, cobbles and gravels amidst a variegated matrix caused by mass wasting on steep slopes. Quaternary residuum is unconsolidated,

weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

6.4.3.3 Paleontology

As described above, the vast majority of the project sites is underlain by the Archean granites of the Laramie batholith and sedimentary units of the Upper Miocene Ogallala Formation. Under the Potential Fossil Yield Classification (PFYC) system, the Bureau of Land Management (BLM) classifies the Archean granites of the Laramie batholith as Class 1, which means "Geologic units that are not likely to contain recognizable fossil remains; units that are igneous or metamorphic, excluding reworked volcanic ash units; and units that are Precambrian in age or older". The Upper Miocene Ogallala Formation, the Madison Limestone and Cambrian rock undivided, and the Pennsylvanian/Permian Casper Formation are all classified as PFYC Class 5, which means "highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils of scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation (Bureau of Land Management 2009). Where it occurs in the study area, this formation is relatively flat-lying and typically covered by surficial geologic deposits and soils.

Although the PFYC is primarily intended to assess potential risks to paleontological resources on public lands, it provides a useful index of where fossils may be found in the vicinity of the proposed Projects. Refer to Map 4 in Appendix F for the distribution of PFYC in the study area. Based on the proposed site plan for the Projects, there are 10-13 WTGs in PWP I that could be located in the Upper Miocene Ogallala Formation and therefore have potential to affect fossil-bearing rocks.

6.4.3.4 Soils

Surficial soils on the site include numerous soil complexes that classify as loam, gravelly sandy loam, very gravelly sandy loam, silt loam, cobbly loam, cobbly very fine sandy loam, and very channery loam (NRCS, 2004). A map of the soil series within the study area is shown in Appendix F, Map 5. Soils within the two proposed project sites are typically well-drained and located on slopes between 0 and 6 percent. Within the study area, there are slopes as steep as 70 percent along hillsides and drainage systems; however, no facilities are being proposed for construction on sleep slopes. No soils at the site

meet state or federal criteria as prime farmland soils. Wyoming does not maintain a list of soils of statewide concern. Table 6-6 summarizes the properties of soils that underlie the proposed facilities.

Table 6-6 Summary of Surficial Soils and Physical Properties.

Soil Series	Map Symbol	Texture (see notes)	Slopes (%)	Soil Erodibilty Factor (K)	Wind Erodibilty Group*	Shrink/Swell Potential
Boyle-Lininger	113	Loam	1 to 15	0.28	5	low
Boyle-Rock outcrop complex	114	Gravelly Sandy Loam	5 to 25	n/a	8	low
Cathedral-Rock outcrop complex	120	Very Gravelly Sandy Loam	6 to 75	n/a	8	low
Kishona-Cambria complex	188	Silt Loam	0 to 6	0.32	4L	moderate
Nunnston loam	202	Loam	2 to 15	0.32	6	high
Pilotpeak-Canwell complex	206	Cobbly Very Fine Sandy Loam	3 to 20	0.32	3	low
Rock outcrop-Cathedral complex	218	Very Gravelly Sandy Loam	10 to 75	0.2	5	low
Shingle-Taluce complex	232	Cobbly Loam	6 to 40	0.28	3	low
Theedle-Kishona-Shingle loams	251	Loam	0 to 6	0.32	4L	moderate
Tyzak-Rock outcrop complex	254	Very Channery Loam	6 to 70	n/a	8	low
Ulrant loam	262	Loam	3 to 15	0.28	6	low

n/a = not available

* A wind erodibilty group consists of soils that have properties that affect their susceptibility to wind erosion, primarily in cultivated areas. The soils assigned to Group 1 are the most susceptible to wind erosion, and those assigned to Group 8 are least susceptible. As shown in the table, the soils within the project boundary range from 3 to 6, which indicates moderately low to moderately high susceptibility wind erosion.

Notes:

Loam = A soil having approx. 40 percent (%) sand, 40% silt, and 20% clay.

Gravelly Sandy Loam = A soil that contains approx. 25% gravel (angular to rounded rock fragments up to 3” in diameter) 52.5% sand, 15% clay and 7.5% silt

Very Gravelly Sandy Loam = A soil that contains approx 55% gravel 38.5% sand, 11% clay and 4.5% silt

Silt Loam = A soil that contains approximately 20% sand, 65% silt, 15% clay

Cobbly Loam = A soil having approx. 25% cobbles (rounded rock fragments 3 to 10 inches in diameter) 30% sand, 30% silt, and 15% clay

Fine Sandy Loam = A soil having more than 50% sand and equal parts silt and clay

Very Channery Loam = A soil that contains approx 25% channer (flat rock fragments up to 6” long) 30% sand, 30% clay and 15% silt

Source: Natural Resources Conservation Service 2006.

Because numerous soil complexes are located within the Project area, the soils that underlie the majority of the proposed turbine and access road locations (i.e., the areas that have the most potential for disturbance during construction) were evaluated for properties and potential limitations. The most prevalent soils within the project area include Boyle-Lininiger loams, 1 to 15 percent slopes; Boyle-Rock outcrop complex, 5 to 25 percent slopes; Cathedral-Rock outcrop complex, 6 to 75 percent slope; Krishona-Cambria silt loams, 0 to 6 percent slope; Nunnston slope, 2 to 15 percent slope; Pilotpeak-Canwall complex, 3 to 20 percent slope; Rock outcrop-Cathedral complex, 10 to 75 percent slope; Shingle-Taluce complex, 6 to 40 percent slope; Theedle-Kishina-Shingle complex, 0 to 6 percent slope; Tyzak-Rock outcrop complex, 6 to 70 percent slope; and the Ulrant loam, 3 to 15 percent slope.

6.4.4 Geologic Hazards and Soil Erosion

The following section describes the potential impacts to geologic hazards and soil resources that could affect and be affected by project construction. The analysis is based on existing literature, published geologic mapping, historical earthquake data, earthquake hazard mapping, seismic characterization, and site-specific geotechnical and soils data.

6.4.4.1 Soil Erosion

The erosion factor (K) indicates the susceptibility of a soil to sheet and rill erosion by water. The K factor is one of six factors used in the Universal Soil Loss Equation to predict the average annual rate of soil loss by natural erosion processes in tons per acre per year. The estimates are based primarily on percentages of silt, sand, and organic matter and on soil structures and saturated hydraulic conductivity. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. As shown in Table 6-6, the soils on the site have an erodibilty factor that ranges from 0.20 to 0.32 (Natural Resources Conservation Service 2006), which indicates low to moderate natural erosion potential. No soils within the Project boundary exceed a K factor of 0.37, the limit set by the NRCS to control erosion hazard. Note, however, that some of these soils can become highly erodible where they underlie roads and trails on steep slopes. Refer to section 6.4.4.5, below, and the reconnaissance-level assessment in Appendix H for a detailed assessment of soil erosion associated with existing roads within the project sites.

6.4.4.2 Expansive Soils

Changes in soil moisture cause certain minerals in soils to either expand or contract. The amount and type of clay minerals in the soil influence the change in volume. Structures or roads built on shrinking or swelling soils could be damaged by the change in volume of the soil. Linear extension (shrink-swell potential) refers to the change in length of an unconfined clod as its moisture content is decreased from a moist state to a dry state, the volume change is reported as a percent change in the soil. Shrink-swell potential is considered low if the soil has a linear extensibility of less than 3 percent; moderate if it is 3 to 6 percent; high if it is 6 to 9 percent; and very high if it is greater than 9 percent.

The uppermost soil layers on the site have a shrink/swell potential between 1.5 and 7.5 percent. Thus, while most of the project sites' soils are rated as having low swelling potential (see Table 6-6) by the Natural Resources Conservation Service (2006), two are rated at moderate and one type is rates as having high swelling potential. The soils and bedrock encountered in the project area during preliminary geotechnical investigations were found to have a low expansive potential when wetted (Terracon 2010).

6.4.4.3 Soil Collapse Potential

Loose, sandy soils or windblown silty loess have the potential for collapse and settlement when wetted or loaded by foundations or structures. Loose to very loose sandy soils may be present within portions of the Project boundary (Terracon 2010), and will be identified and characterized during the final design geotechnical investigation to be conducted prior to each Projects' final engineering, so that they can be avoided or potential impacts mitigated.

6.4.4.4 Soil Corrosion Potential

Corrosion potential of soils is related to electrochemical or chemical reaction in the soil that corrodes or weakens concrete or steel. The corrosion rate is influenced by the sulfate and chloride content, clay percentage and type, soil resistivity, moisture content, and pH of the soils. The surficial soils on site are rated as "low" corrosion potential (Natural Resources Conservation Service 2006). Sulfate and chloride testing of onsite materials indicated negligible levels. Consideration should be given to the use of Type I/II Portland cement and foundation concrete should be designed for low sulfate exposure in accordance to ACI Design Manual, Section 318, Chapter 4 (Terracon 2010).

6.4.4.5 Soil Properties for Access Roads, Crane Pads, and Foundations

Access Roads - Access roads for construction equipment and maintenance vehicles are an integral part of the proposed Projects. PWP I, LLC's and PWP II, LLC's access roads will have an all-weather gravel surface and be capable of supporting automobile and light truck traffic year-round. The soil properties that affect the traffic-supporting capacity include soil strength, subsidence, linear extensibility, potential for frost action, depth to water table, and ponding. Approximately seven different dirt and gravel-surface roads (such as Mormon Canyon Road) presently traverse the study area.

Based on the Soil Survey of Converse County (NRCS 2006), soils in the study area are rated as "somewhat limited" to "very limited" for local roads (Natural Resources Conservation Service 2006). A rating of "somewhat limited" indicates the soil has features that are moderately favorable for the specified use and the limitation can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. A rating of "very limited" indicates that the soil has one or more features that are unfavorable for the specified use. These limitations can generally be overcome with major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected. Some soils present in the study area received these ratings based primarily on slope grade, shrink-swell potential, depth to bedrock, and the amount of large stones present. Access roads have been sited to avoid traversing unfavorable soils wherever possible.

The surficial soil material and bedrock underlying existing access roads and potential access road locations includes sands, clays, shales, and sandstones (Terracon 2010). The thickness of the proposed aggregate-surfaced roadway sections will be determined based on traffic duration and frequency, the requirements of the American Association of State Highways and Transportation Officials (AASHTO) and the specifications of the WTG vendor for design of roadways. Following the final geotechnical investigation for each Project, the soil strength and other properties that affect roadway design and performance will be evaluated and the access roads designed accordingly to support the anticipated traffic loads.

In its Wildlife Protection Recommendations for Wind Energy Development in Wyoming (*Recommendations*), the Wyoming Game and Fish Department (WGFD) recommends that wind development proponents assess the potential for sediment impacts to aquatic habitats. The recommended assessment method is the Watershed Assessment of River Stability and Sediment Supply (WARSSS)

approach (Rosgen 2009, EPA 2008). WARSSS is a three-phase methodology that identifies the processes responsible for significant changes in erosion, sedimentation, and related stream channel instability. The first phase of WARSSS is known as a reconnaissance-level assessment (RLA). During the summer of 2010, SWCA Environmental Consultants completed a RLA in the study area, which focused on the major roadway through the two projects sites (Mormon Canyon Road), one existing access road, and the two major streams in the study area, Willow Creek and Virden Creek. A copy of the RLA is provided in Appendix H.

The RLA determined that two of the sub-watersheds in which the Projects are located, the Box Elder Creek - Hunton Creek and Box Elder Creek - Virden Creek sub-watersheds are currently "at risk." One of the primary factors resulting in this classification is the presence of undersized, breached, and/or improperly aligned culverts on road crossings of Willow Creek and its tributaries including Lone Tree Creek and Gross Creek. Prior to initiating construction on PWP I, the EPC contractor will repair and improve these stream crossings to ensure existing causes of erosion and sedimentation are eliminated and that construction vehicles do not exacerbate existing or create new erosion problems along new and improved access roads.

Crane Pads - Based on the information from the preliminary geotechnical investigation, the native soils and bedrock materials are suitable for reuse as structural fill (Terracon 2010). However, limited soil improvements may be required in areas where loose sandy soils are present. These areas will be identified during the final design geotechnical investigation.

Foundations - The WTGs, O&M building, and substations will be supported on properly designed and engineered foundations. The preliminary geotechnical investigation identified a variety of native materials underlying the proposed Project sites including silts, sands, clays, gravels, sandstone, claystone, siltstone, and conglomerate. Based on the properties of the soils and the bedrock, the use of gravity foundation systems for support of the proposed WTGs is considered acceptable (Terracon 2010). Use of spread-foot and mat foundations for support of structures located within the proposed substations are also considered acceptable. Allowable bearing pressures range from 3,000 lbs per square foot on poorly graded sand with silt and gravel, to 6,000 lbs per square foot on claystone, siltstone, sandstone and conglomerate bedrock. The footings will be embedded at least 4 ft below existing grade for confinement and frost penetration. Limited soil improvements or over-excavation may be required in areas where loose sandy soils or potentially swelling clayey soils or claystones are present.

6.4.4.6 Landslides

Within the study area, no landslides have been mapped by the Wyoming Geologic Survey or noted on other published geologic maps (McLaughlin and Ver Ploeg 2007). The closest mapped landslides are approximately 1.5 miles to the east of the study area boundary and are limited to the steep north and southwest-facing slopes of an unnamed small peak. The preliminary geological investigation found no observable signs of prominent landslides/slope failure on the steepest ridges and bluffs within the study area. The preliminary geotechnical study recommended that a slope stability analysis be performed to determine slope stability of any WTG locations situated near slopes (Terracon 2010).

Steep-sided gullies in the vicinity could be subject to localized surficial slumping and streambank failures and associated rapid erosion and undercutting during large runoff events. Bank slumps would not impact or affect the overall stability of Project facilities. Facilities, WTGs, and structures will not be sited or located near channels that may have the potential for rapid erosion, bank failures, or channel migrations. Future access road construction over gullies or drainage paths will require appropriate scour and erosion protection, as well as properly sized culverts to pass potential floods. Floods would not present a significant hazard for the Projects, as the project sites are located above the modern day floodplain (Terracon 2010).

6.4.4.7 Mining

The National Mine Map Repository indicated 8 mine sites in Converse County, Wyoming. Based on a review of the Root Creek, Wyoming USGS 7.5 Minute Topographic Quadrangle dated 1964, a mine was indicated on the southern portion of a ridge located within the PWP I project site. During the preliminary geotechnical investigation, the mine appeared to be a rock quarry. Presently, rock from this quarry is being processed for use as aggregate base course and ballast material. Based on our conversations with the mine operator and local residents, the quarry was historically mined for feldspar for use in making colored glass. The mine is approximately 200 feet long by 50 feet wide with sidewalls approximately 20 to 30 feet in height. Observations of the sidewalls of the mine indicate that the lithology consists of approximately 8 feet of overburden material followed by a rock formation [most likely Archean Granites] consisting primarily of quartz with seams of mica and feldspar. The formation has an approximate strike of N45W and dips steeply.

6.4.4.8 Oil and Gas

Oil and gas extraction can cause ground movement due to the stress-relief of the rock and groundwater movement. The preliminarily geotechnical investigation indicates that no active oil and gas extraction has been reported within the study area.

6.4.5 Faults and Seismicity

A complete seismological characterization of a site typically includes a summary of historical seismicity, an analysis of the Seismic Zone Maps, deterministic analysis of active faults, floating or random earthquakes analysis, and probabilistic seismic hazard analysis. These analyses are summarized below.

6.4.5.1 Seismicity

Converse County and neighboring Natrona County have had 25 historic earthquakes with a magnitude of 3.0 and greater. Table 6-7 presents a summary of the historic earthquakes in the region (Case, James C; Toner, Rachel N; Kirkwood, Robert 2003) (Case, James C; Kirkwood, Robert; Toner, Rachel N. 2002). Historical seismic activity has occurred within approximately 22 miles of the project vicinity. Earthquakes with estimated Modified Mercalli Intensity scales up to intensity VII have occurred between 1873 and 2003. It appears that very little damage has occurred due to these earthquakes.

PWP I and PWP II are located within Seismic Zone 1, which is defined as a 90 percent chance of not exceeding a peak ground acceleration of 0.10g (where g = the acceleration of gravity) in 50 years, or a 500-year return period. A “floating” earthquake is an earthquake that occurs randomly in a tectonic province and is not necessarily associated with a known fault. The floating earthquake analysis for the region indicates that the largest floating earthquake would have a magnitude between 6.00 through 6.50 (Geomatrix Consultatnts, Inc. 1988). This floating earthquake, placed 10 miles from any structure, would generate peak horizontal acceleration of approximately 0.15 g at the site.

Table 6-7 Summary of Historical Earthquakes in Natrona and Converse County.

Date	Location*	Magnitude/Intensity	Damage
Natrona County			
April 14, 1947	LaPrele Creek	V	Windows rattled, chairs moved
August 21, 1952	7 miles NNE of Esterbrook	IV	None reported
September 2, 1952	7 miles NNE of Esterbrook	N/A	N/A
January 5, 1957	7 miles NNE of Esterbrook	III	None reported
March 31, 1964	7 miles NNE of Esterbrook	IV	None reported
January 15, 1978	3 miles NNE of Esterbrook	3/III	None reported
November 15, 1983	15 miles NE of Casper	3/III	None reported
December 5, 1984	Laramie Range	2.9	None reported
June 30, 1993	15 miles N of Douglas	3	None reported
July 23, 1993	13 miles NNW of Toltec	3.7/IV	None reported
December 13, 1993	8 miles E of Toltec	3.5	None reported
October 19, 1996	15 miles NE of Casper	4.2	None reported
Converse County			
December 10, 1873	2 miles N of Powder River	III	None reported
June 25, 1894	3 miles SW of Evansville	V	Dishes rattled, people thrown from beds
November 14, 1897	3 miles SW of Evansville	VI or VII	Considerable damage to few buildings, people thrown to floor
October 25, 1922	6 miles NNE of Barr Nunn	IV-V	None reported
December 11, 1942	14 miles S of Midwest	IV-V	None reported
August 27, 1948	6 miles NNE of Barr Nunn	IV	None reported
January 23, 1954	7 miles NE of Alcova	IV	None reported
August 19, 1959	6 miles NNE of Barr Nunn	IV	None reported
January 8, 1968	10 miles NNW of Alcova	3.8	None reported
January 16, 1973	13 miles SE Ervay	N/A	None reported
March 9, 1993	17 miles W of Midwest	3.2	None reported
November 9, 1999	32 miles NW of Wattman	3.1	None reported
February 1, 2003	16 miles NNE of Casper	3.7	None reported
August 29, 2004	19 miles E of Glenrock	3.8/IV	None reported

Notes:
Cardinal direction have been abbreviated: N = North, S = South, E = East, W = West.
Source: (Case, James C; Kirkwood, Robert; Toner, Rachel N. 2002) (Case, James C; Toner, Rachel N; Kirkwood, Robert 2003).

The Uniform Building Code uses the 2,500 year interval probabilistic earthquake maps for design of structures and facilities. Based on the 2,500 year map (which is equivalent to a 2 percent probability of exceedance in 50 years), the estimated peak horizontal acceleration in the study area is expected to be approximately 0.20g. This would be equivalent to an intensity VI to VII earthquake. An intensity VI earthquake is generally felt by all and can move heavy furniture but causes slight damage. An intensity VII earthquake results in negligible damage to buildings of good design and construction.

The seismic potential for the project areas is low. For new construction, the facilities and turbine foundations will be designed for the maximum considered earthquake (MCE), according to the International Building Code (IBC), and the site will be assigned a seismic site class based on soil properties. Seismic design issues will be fully addressed in a separate Geotechnical Data Report.

6.4.5.2 Faults

The USGS's Quaternary Fault and Fold database shows one suspected active fault, the South Granite Mountains fault system, approximately 75 miles to the southwest. This fault is classified as a Class B fault. A Class B fault shows evidence for Quaternary deformation, but the fault might not extend deeply enough to be a potential source of significant earthquakes (United States Geological Survey 2008). No surface fault ruptures exist in the study area.

6.4.6 Construction Impacts

There will be a certain amount of disturbance of surficial soils and excavation into soils and weak bedrock associated with construction of the access roads and collection system, WTGs, and substations. As indicated in Table 3.5, a stormwater pollution prevention plan (SWPP) will be developed with a Notice of Intent (NOI) for the required Wyoming Pollution Discharge Elimination System (WYPDES) General Stormwater Construction Permit and implemented to minimize soil erosion during construction of the projects.

As stated above, the RLA (Appendix H) conducted in the study area determined that two of the sub-watersheds in which the Projects are located are considered "at-risk" for erosion and sedimentation of stream channels and aquatic habitats. This designation is largely due to poorly designed and degraded stream crossings along Mormon Canyon Road. Prior to construction of PWP I, the existing culverts at

these crossings will be reset or redesigned and replaced in order to improve stream flows and minimize erosion and sedimentation. PWP I, LLC and PWP II, LLC and their EPC contractor will conduct a pre-construction onsite visit and yearly post-construction onsite visits with WGFD and DEQ personnel to ensure that BMPs outlined in the SWPPP are working as designed. As per WGFD *Recommendations*, if any problems are observed, WGFD will provide recommendations to fix the problems. If the problems are not fixed in a timely manner, WGFD may recommend that additional monitoring be conducted.

6.4.6.1 Geotechnical Investigation for Final Design

The subsurface conditions at every WTG site can have variable soil properties that influence the engineering design and construction. A detailed geotechnical investigation and testing program will be conducted to evaluate the engineering properties of the soils and measure groundwater levels at each proposed WTG location. Geotechnical analyses will be used to calculate bearing capacity of the soils and bedrock and conduct stability analysis of the WTGs.

The geotechnical investigation will consist of a combination of soil borings, rock coring, geophysical investigations, and test pits. Shallow sampling (upper 5 ft of soil) is typically targeted for access roads, crane walk paths, crane pad design, and collector cable design. Deeper sampling (up to 50ft) will be used to evaluate foundation conditions for each WTG location. Samples collected during the investigation will be tested for engineering properties including compressive strength, Atterberg limits, grain size, and moisture content.

Wind farm civil infrastructure includes permanent and temporary access roads, temporary crane walk paths, crane pads, turbine foundations, substation foundations, and public road improvements. Each of these components requires specific design calculations, drawings, and final engineering for successful construction and future operations. Project facilities will be micro-sited and engineered to avoid or compensate for geologic and soil hazards.

Various foundation types can be used for turbine support including: gravity/spread footings, anchored pads, drilled shafts, and deep piles. The foundation type for PWP I and PWP II WTG's will be selected on a turbine-by-turbine basis depending on soil conditions and depth to bedrock. During the engineering design of the turbine foundations, the soil properties of the site, dynamic loading due to operation of the turbine, and site seismic properties will be considered. Foundation load data for the specific turbine type

(obtained from the turbine manufacturer) includes extreme normal operating loads, required foundation stiffness and other design criteria used for final foundation design.

Seismic considerations consist of evaluating the site with respect to anticipated maximum earthquake ground motions and the resulting seismic loading on the turbine. Seismic design values are based on the engineering properties of the upper 100 ft of the subsurface soils and rock, and also the short- and long-period spectral response acceleration as a percentage of gravity.

Detailed geotechnical investigations have been initiated for the proposed PWP I turbine layout to determine the proper foundation for each turbine location. Geotechnical investigations for PWP II will be initiated when the State Lands Board determines whether or not PWP II, LLC will be granted a wind energy lease on state lands. Proper engineering design will be used for all Project facilities. No impacts associated with geologic hazards such as seismic events, settlement, or landslides that would substantially impair the health, safety, or welfare of inhabitants or expected inhabitants are anticipated to occur as a result of Project construction. Implementation of best management practices (BMPs) during construction will ensure that soil disturbance does not result in levels of erosion and sedimentation that would pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the affected area.

6.4.7 Operation Impacts

Best Management Practices put in place during construction will ensure that activities carried out during operations will minimize soil erosion and prevent stream sedimentation. Standard dust control practices will be used to minimize fugitive dust generation and attendant wind erosion during operations. Roads and culverts will be upgraded during construction and maintained during operations to prevent sedimentation to creeks or other waterways. Impacts to geology and soils during the operational phase of the projects will be negligible.

6.5 WATER SUPPLY: YIELD AND ANALYSIS

6.5.1 Regulatory Jurisdiction

If an applicant for an Industrial Siting Permit plans to construct a facility that will use more than 800 acre-feet (ac-ft) (260.7 million gallons) of water per year, the applicant must submit a water supply and water

yield analysis to the Wyoming State Engineer's Office (WSEO). The State Engineer will then review the analysis and "render a preliminary opinion as to the quantity of water available for the proposed facility". This preliminary opinion will be made available for public comment, and the State Engineer will consider submitted comments in preparing a final opinion. The State Engineer's final opinion is binding on the Industrial Siting Council (W.S. §35-12-108).

6.5.2 Construction Water Use

Water uses during construction will include road applications for dust control and compaction; and for mixing at the concrete batch plant. During construction, water will be obtained from an existing senior water rights holder within the project area and transported to the site and during operations of the Projects a new well will be constructed in accordance with a WSEO Permit to Appropriate Ground Water. Water will either be put to immediate use or placed in a 10,000-gallon temporary water storage tank.

The primary use of water during construction will be for dust control on the Projects access roads. An average of approximately 10,000 gallons will be applied to access roads on a daily basis. The actual amount of water applied to roads on any given day is dependent on daily temperatures, humidity, wind speeds, and local precipitation amounts.

In addition to the water used in dust control, each WTG location will require approximately 9,000 gallons of water per 300 cubic yard concrete foundation.

Table 6-8 shows that an estimated 4.1 acre-feet (1,329,000) gallons will be required to construct PWP I. Table 6-9 shows that an estimated 3.3 acre-feet (1,079,000 gallons) will be required to construct PWP II. Based on the estimated construction water balance calculations, neither PWP I nor PWP II will exceed the 800 acre-foot per year threshold; therefore, neither project will require a WSEO water supply yield analysis or opinion.

Table 6-8 Estimated Construction Water Use - PWP I.

Material	Foundations	Total Water Use (Approximate)
Water Use for Concrete Mixing		
9000 gallons / GE WTG (300 yd^3 per foundation)	31	279,000 gallons (0.9 ac-ft)
Material	Days	Total Water Use
Water Use for Dust Control and Road Compaction		
Compaction watering during access road construction	30	300,000 gallons (0.9ac-ft)
Dust Control during active construction	75	750,000 gallons (2.3 ac-ft)
Total Gallons		1,329,000 gallons (4.1 ac-ft)

Table 6-9 Estimated Construction Water Use - PWP II.

Material	Foundations	Total Water Use (Approximate)
Water Use for Concrete Mixing		
1000 gallons / GE WTG (300 yd^3 per foundation)	31	279,000 gallons (0.9 ac-ft)
Material	Days	Total Water Use
Water Use for Dust Control and Road Compaction		
Compaction watering during access road construction	30	300,000 gallons (0.9ac-ft)
Dust Control during active construction	50	500,000 gallons (1.5 ac-ft)
Total Gallons		1,079,000 gallons (3.3 ac-ft)

6.5.3 Operations

Once the PWP I and II projects are operational, only minimal daily water use will be required. Water usage will likely be limited to the O&M building for restrooms, sinks, hand washing stations, showers, internal/external hose, and dishwasher. An approximate staff of six will be employed at the PWP I and PWP II and, based on standard assumptions for commercial offices, the operational water use will be approximately 761 gallons per day (Table 6-10).

Table 6-10 Estimated Operations Water Use - PWP I and PWP II Combined.

Use	Frequency (Occurrences per Day)	Consumption per Use (Gal per Occurrences)	Total Consumption (Gallons per Day)
Bathroom Sinks	36	2	72
Toilets	36	4	144
Shower	6	30	180
Dish Washer	1	15	15
External/Internal Hose	15	15	225
Maintenance Area Sinks	25	5	125
Total Gallons			761 gpd
Annual Usage			277,765 gallons (0.9 ac-ft)

6.5.4 Water Sources

Wyoming water law operates under the prior appropriation doctrine, or “first in time-first in right.” Those holding an earlier priority water right are allowed to receive their full portion of water before those with junior rights may receive any water under their right.

Water rights can be issued to anyone who plans to make beneficial use of the water. Recognized beneficial uses include: irrigation, municipal and industrial, power generation, recreational, stock, domestic, pollution control, in-stream flows, and miscellaneous uses. Water rights holders are limited to withdrawals necessary for the purpose of their rights.

Water supply needs for the PWP I and PWP II projects will be met with an existing senior water rights holder via a temporary use agreement. On-site water sources are expected to provide adequate water for

construction. If these sources are insufficient, water will be purchased from additional existing water rights holders.

6.5.4.1 Platte River Recovery Implementation Agreement Compliance

In 1997, Colorado, Wyoming, Nebraska, and the Department of Interior partnered together to develop a shared approach to managing the Platte River. The result was the Platte River Recovery Implementation Program, a process to better manage the Platte River for the health of the ecosystem and the people who depend on it. The program's three main elements include increasing stream flows in the central Platte River during certain time periods through retiming and water conservation/supply projects; enhancing, restoring and protecting habitats for target bird species; and accommodating certain new water-related activities. Mitigating the adverse impacts of certain new water-related activities will be met through the implementation of state and federal depletion plans.

The WSEO will regulate surface and groundwater use/supply for PWP I and PWP II projects to ensure compliance with applicable regulations and the Platte River Implementation Agreement. Therefore, the proposed Projects will be constructed and operated in accordance with the water use/supply permits and will be consistent with the goals of the Platte River Recovery Implementation Agreement.

6.6 SURFACE AND GROUNDWATER RESOURCES

6.6.1 Regulatory Jurisdiction

Potential impacts to water quality associated with construction and operation of the proposed Projects are covered under Sections 401 and 402 of the Federal Water Pollution Control Act (now commonly referred to as the Clean Water Act) of 1972. In Wyoming, the WDEQ has been delegated jurisdiction over water quality by the U.S. Environmental Protection Agency (EPA). Accordingly, the WDEQ – Water Quality Rules and Regulations and the Wyoming Environmental Quality Act (W.S. § 35-11-102) provide primary jurisdiction over surface and groundwater quality in the state.

6.6.2 Surface Water

The proposed Projects are located within several sub-watershed boundaries. These sub-watersheds include the Lower Deer Creek-North Platte River, North Platte River-Dry Creek, Little Deer Creek, Box

Elder Creek-Hunton Creek, Middle Deer Creek-North Platte River, and Box Elder Creek-Virden Creek drainages. The major named steams within the vicinity of the Projects include Dry Creek, Willow Creek, Lone Tree Creek, Gross Creek, East Fork Little Deer Creek, Virden Creek, Duck Creek and Strawberry Creek.

Several stock ponds within gullies, draws, gulches, and springs occur throughout the study area. The natural drainages within the study area appear to be fed by spring snowmelt, summer thunderstorm surface runoff, and groundwater.

Based on a review of the WDEQ's Section 303(d) list of impaired waters, there are no streams listed as impaired in the vicinity of the study area. Also, according to the Federal Emergency Management Agency (FEMA) flood insurance rate maps, there are no mapped 100-yr floodplains within or in the vicinity of the project study area boundary. Most of the streams in the study area are considered by the WDEQ to be Class 2AB waters. Class 2AB waters and their perennial tributaries support game fish populations or spawning and nursery areas on at least a seasonal basis. Designated uses for Class 2AB waters include drinking water, nongame fisheries, fish consumption, aquatic life other than fish, primary contact recreation, wildlife, industry, agriculture, and scenic value (WDEQ 2002).

Dry Creek, located in the northern portion of the study area near Mormon Canyon Road, is the only Class 3 water in the area of site influence. Class 3 waters are intermittent, ephemeral or isolated waters and because of natural habitat conditions, do not support nor have the potential to support fish populations or spawning. Class 3 waters generally have wetland characteristics and provide support for invertebrates, amphibians, or other flora and fauna, at some stage of their life cycles. Class 3 designated uses include aquatic life other than fish, recreation, wildlife, industry, agriculture and scenic value.

6.6.2.1 Construction Impacts

Potential impacts to surface water features from erosion and sedimentation will be minimized and prevented by measures to control runoff during construction and operation of the PWP I and PWP II projects. Several culverts have been identified along the proposed access roads that will be replaced or reset to assist with preserving sensitive watershed areas. Refer to Section 6.4.4 and 6.4.6 for a description of the RLA that was completed for the project area and is presented in Appendix H. In accordance with WGFD Recommendations, improvements to existing roads and stream crossings and the design of new

access roads will ensure that erosion and sedimentation of area streams is prevented during construction and operation of the Projects.

A Stormwater Pollution Prevention Plan (SWPPP) will be developed for the required WYPDES General Stormwater Construction Permit. The SWPPP will identify the engineered controls to minimize surface runoff and impacts to surface waters from construction of access roads, the WTG locations, O&M building, electrical substations, and the temporary concrete batch plant.

Fuel Storage - To prevent the release of petroleum products, fuel storage areas will be managed and controlled in accordance with federal EPA standards and state regulations. Implementation of BMP's such as proper labeling and storage, secondary containment, and inspection as required by the WYPDES General Stormwater Construction Permit will reduce the potential for accidental release of hazardous materials to water resources.

Spill Prevention - A Spill Prevention, Control, and Countermeasure Plan (SPCC) will be developed and implemented at the site during construction and operation of the Projects.

Wetlands and Other Waters of the United States - Any work within jurisdictional wetlands and other waters of the United States will be conducted in accordance with Sections 404 and 401 permits of the Clean Water Act (CWA). Therefore, no adverse or significant impacts to surface water resources are anticipated from construction of the Projects. There are no regulatory floodplains in the study area, and no floodplain impacts are anticipated.

With implementation of standard BMPs and the measures described above, Project construction will not pose a threat of serious injury to the environment nor the social and economic condition of current or expected inhabitants in the affected area.

6.6.2.2 Operations Impacts

PWP I, LLC and PWP II, LLC will operate the proposed Projects in accordance with all issued conditions of approval from the WDEQ, WGFD, and all relevant local, state, and federal permits. Operation of PWP I and PWP II will not result in substantive impacts to surface water resources that would impair the health, safety, or welfare of current or expected inhabitants in the area of the site influence.

6.6.3 Groundwater

The North Platte River Basin contains a wide variety of geologic formations and structural elements. The proposed Projects are located within the Precambrian and Late Tertiary Aquifer Systems (Wyoming Water Development Commission 2010). The Paleozoic aquifer is characterized by the Tensleep and Flathead Sandstone, Bighorn Dolomite and Madison Limestone; while the Precambrian aquifer is characterized by crystalline bedrock.

Groundwater movement within the aquifer is in a northeasterly direction. The majority of groundwater use in the area is for agricultural and domestic purposes.

6.6.3.1 Construction Impacts

During the construction phase, the two Projects' water supply needs will be met with through a senior existing water rights purchase. During construction, a well will be drilled to supply water to the O& M building and ongoing needs for the Projects.

Portable toilets and sinks will be provided for onsite sewage handling during construction and will be pumped and cleaned weekly by the contracted waste company. No other wastewater will be generated during construction.

Any quantities of solid waste materials generate by activities at the Project sites will be disposed of in an appropriate manner at suitable licensed disposal sites. Licensed waste haulers will be used to remove wastes and dispose of such wastes in licensed and approved facilities according to local regulations and procedures.

In response to concerns raised by Dave Andrews, Glenrock Public Works Department, concerning potential contamination of the town's water supply, WWI contracted Bowen Collins & Associates (BC&A), an independent water resources engineering and consulting firm, to investigate the issue. BC&A determined that there is no risk of biological contamination of the town's wells and that the risk of chemical contamination is minimal. There are no significant quantities of chemicals used in or stored on a wind energy facility. Petroleum products used during construction can be stored in areas with

secondary containment located away from surface water and recharge zones and thereby have minimal risk of contamination.

BC&A determined that the only risk to Glenrock's water supply resulting from the proposed Projects would be from soil disturbance during construction. In the absence of BMPs, soil disturbance and compaction could result in an increase in surface water runoff that would have potential to infiltrate and impact aquifer water quality. To reduce this risk, BC&A recommended that the stormwater pollution prevention plan (SWPPP), developed as part of the two Projects' WYPDES permit identified in Table 3.5, identify and implement the engineered controls that best minimize surface runoff and impacts to surface waters from the projects. Implementing these controls will, in turn, minimize the potential for impacts to groundwater in the project area. Refer to Appendix G for a copy of BC&A's analysis of this issue.

In keeping with BC&A's recommendations, PWP I, LLC and PWP II, LLC will ensure that the EPC contractor prepares a comprehensive construction SWPPP that includes appropriate BMPs. The SWPPP will address sensitive watershed areas (such as those located adjacent to streams) impacts to which could have adverse impacts on aquifer recharge zones and Glenrock's water supply. The SWPPP will also specify that there shall be no fuel, oils, or lubricants stored within the town's wellhead protection zone boundary. With implementation of appropriate BMP's and the SWPPP, construction impacts to groundwater will not result in impacts to the groundwater resources or to the health, safety, or welfare of the current or expected inhabitants in the area of affect.

6.6.3.2 Operations and Maintenance Impacts

As previously discussed, most of the operational water usage would be associated with potable water needs for the six operations staff. It is anticipated that a local groundwater well will be used to supply water for domestic use in the O&M building. There is no existing well, so WWI will need to submit the proper paperwork for a permit to the SEO and then the EPC contractor will need to drill it. Water used at the O&M building will be treated and discharged to an on-site septic system. A septic permit will be obtained from the implementing agency and issued conditions will be maintained to protect any potential impacts to groundwater.

During the operations phase, the Projects will use various quantities of oils and lubricants in the maintenance of the WTGs. The quantities of other chemicals used during operations are considered *de minimus* and therefore pose negligible risk of contamination.

6.7 WETLANDS AND WATERS OF THE U.S.

Information on wetlands and other waters of the U.S. located within the project study area has been obtained from the National Wetlands Inventory (NWI) (USFWS 2008) and the National Hydrologic Dataset (NHD) (USGS 2010). This data has been used to site project facilities in locations that would avoid impacts to jurisdictional waters. Following final design, a reconnaissance-level wetlands survey will be conducted and any wetlands or other waters of the U.S. with potential to be impacted by the proposed Projects will be subject to a formal wetland delineation and, where necessary, permitting.

6.7.1 Regulatory Jurisdiction

The U.S. Army Corps of Engineers (USACE) and the Environmental Protection Agency (EPA) share jurisdiction over wetlands and other waters of the U.S. under the Clean Water Act of 1972. The objective of the *Clean Water Act* is to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. Section 404 of the Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits authorizing discharge of dredged or fill material into the waters of the United States, including wetlands.

6.7.2 Area of Site Influence

The area of site influence is the study area boundary shown on Map 6 in Appendix F and the sub-watersheds identified in Section 6.6.2. The study area is located in the North Platte River watershed in the upper portions of the Lower Deer Creek - North Platte River, North Platte River - Dry Creek, Little Deer Creek, Box Elder Creek - Hunton Creek, Middle Deer Creek - North Platte River, and Box Elder Creek - Virden Creek sub-watersheds. Although located within the study area, the headwaters of Duck Creek, located within the Middle Deer Creek - North Platte River sub-watershed, is located west of and outside the two proposed project sites. Within the sub-watersheds encompassing the proposed project sites, there are several ephemeral and intermittent streams such as the East Fork of Little Deer Creek, Jackson Fork of Little Deer Creek, Lone Tree Creek, Gross Creek, and Wood Creek that are headwaters

to the upper perennial portions of Deer Creek, Willow Creek, Virden Creek, Box Elder Creek, and Duck Creek.

6.7.3 Wetlands

Wetlands are defined by the USACE as "those areas that are inundated or saturated by surface or ground water 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. Wetlands generally include swamps, marshes, bogs, and similar areas" (40 CFR 230.3(t)). Wetlands are considered a special type of waters of the U.S. (see Section 6.7.4, below).

NWI data indicate the presence of four wetland types within the study area: Freshwater Emergent Wetlands, Freshwater Forested/Shrub Wetlands, and Freshwater Ponds. Freshwater emergent wetlands consist of marshes and wet meadows dominated by herbaceous grass-like plants include grasses, sedges, and rushes. These wetlands occur throughout the study area in narrow bands in and along intermittent and perennial streams. Most of these emergent wetlands in the study area are too small to have been mapped by the NWI and probably too small to be depicted on Map 6. The largest emergent wetlands in the study area occur to the west of the two project sites in the Upper Duck Creek drainage, which will not be affected by the proposed projects. There are also a number of small emergent wetlands located along ephemeral and intermittent streams on the south side of the PWP II site.

Within the study area, Freshwater Forested/Shrub Wetlands are dominated by willows and occur along the perennial portions of Willow and Virden Creeks. Freshwater ponds occur both in conjunction with the shrub wetlands along Willow Creek and Virden Creek as well as along ephemeral and intermittent streams tributary to these streams and Wood and Box Elder Creeks. Many of the latter have been constructed over time by local residents and serve as stock ponds.

6.7.4 Waters of the U.S.

Waters of the U.S., or jurisdictional waters, are defined by the USACE as "all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide. These include both interstate waters including wetlands and intrastate waters such as lakes, rivers, streams mudflats, sandflats, wetlands, sloughs, prairie

potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce" (33 CFR 328.3). Perennial and many intermittent tributaries to traditionally navigable waters like the North Platte are considered jurisdictional. Ephemeral streams that do not flow for an entire season and are without a defined bed and bank are generally considered to not be jurisdictional.

WTGs, substations, and the O&M building will be sited in uplands to avoid impacts to wetland resources. Mormon Canyon Road and other access roads in the project area cross over or run alongside perennial and intermittent drainages. Several of these crossings are in poor condition and will need to be upgraded prior to the construction of the two Projects to ensure that construction activities do not contribute to the existing levels of erosion and sedimentation in these waterways. WWI will apply for a CWA Section 404 permit and a WDEQ-WQD Temporary Increase in Turbidity permit, as required for proposed improvements to existing or new access roads within the two project sites. As part of the 404 permitting process, a formal wetland determination and delineation would be conducted in accordance with USACE protocols for wetlands with potential to be affected by construction.

6.7.5 Construction Impacts

To the extent possible, construction vehicles will use Mormon Canyon road and existing dirt roads to access WTG locations and other project facilities. As described above, some of the existing culverted stream crossings along Mormon Canyon road are in unsatisfactory condition and will likely be replaced during construction or otherwise in conformance with the Projects' pending road use agreement(s) with Converse County. Measures to improve these existing stream crossings and avoid or minimize the discharge of dredged and fill materials into wetlands and other waters of the U.S. will be incorporated into the final site plan and implemented during construction.

Map F-6 in Appendix F shows that a PWP I access road for a three-WTG array just north of Lone Tree Creek would cross two intermittent drainages tributary to Lone Tree Creek and Willow Creek. Prior to completing the final access road layout and design, the route for this access road and two other PWP I access roads located adjacent to intermittent streams will be surveyed for wetlands and other waters of the U.S. If practicable, crossing of or encroachment on these tributaries will be avoided in the final road design. Should road crossings or collector line crossings prove necessary, WWI will conduct a wetlands delineation and apply for the appropriate state and federal permits. Based on the preliminary site plan and

existing data on the location of wetlands and other waters of the U.S. in the PWP II project site, construction activities will be able to avoid adverse impacts to wetlands and waters of the U.S. in this area. As a result, project construction will not pose a threat of serious injury to the environment nor to the social and economic condition of current or expected inhabitants in the affected area.

6.7.6 Operation Impacts

Following project construction, temporary land uses including crane pads, laydown and parking areas, the concrete batch plant, and collector line trenches will be reclaimed, re-contoured, and revegetated. These activities are considered part of construction and will, if and as necessary, be permitted along with other construction impacts. Operation and maintenance of the proposed Projects will have no effect on wetlands and other waters of the U.S.

6.8 VEGETATION, SPECIAL STATUS PLANTS, AND RARE PLANT COMMUNITIES

6.8.1 Regulatory Jurisdiction

The *Endangered Species Act* (ESA) provides protection for federally listed threatened and endangered plants located on federal lands. Federally listed plants that occur on non-federal lands are protected only if there is a state law that prohibits taking of listed plants or if their taking involves any violation of state criminal trespass law. The State of Wyoming does not have a law prohibiting the take of plants and the Projects do not involve federal lands, so there is very limited federal or state regulatory jurisdiction over rare plants in the study area. This jurisdiction applies only to federally listed plants occurring in wetlands and other waters of the U.S. that could be affected by construction activities subject to a CWA Section 404 permit process (e.g. culvert replacement).

One federally listed threatened plant species, the Ute Ladies'-tresses orchid (*Spiranthes diluvialis*) was thought to have potential to occur in wetlands in the project area. Systematic surveys for this species were conducted in appropriate habitats during the species' flowering period (SWCA 2010a). Although a closely related plant, the hooded ladies'-tresses (*Spiranthes romanzoffiana*) was observed during these surveys, no *S. diluvialis* were detected. Thus, no federally listed plants are believed to occur in the study area and the ESA does not apply.

Five plants considered "Species of Special Concern" by the State of Wyoming have potential to occur in the study area. This status does not confer any special protection to plants and no surveys for these species were required or conducted within the study area. There are no rare plant communities known to occur in the study area.

The Wyoming Weed and Pest Control Act of 1973 and the *Federal Noxious Weed Act of 1974* establish state and federal jurisdiction over the designation and management of noxious weeds. In Wyoming, there are 25 species of plants considered noxious weeds. To date, no baseline surveys of noxious weeds have been conducted within the study area.

6.8.2 Area of Site Influence

The study area for vegetation, special status plants, and rare plant communities consists of the study area boundary delineated in Appendix F, Map F-8. The actual area of site influence is likely to be limited to the PWP I and PWP II project footprints and the margins of County access roads leading to the two project sites.

6.8.3 Existing Vegetation

Vegetation cover in the study area is typical of the Foothill Shrublands and Powder River Basin ecoregions (Chapman et al. 2004), dominated by foothill shrubland, sagebrush steppe, and mixed-grass prairies. Foothill shrubland is characterized by montane shrubland consisting of mountain big sagebrush and mountain mahogany, surrounded by extended groves of quaking aspen trees, low-growing common juniper, and patches of limber pine trees. Deciduous shrubland communities are interrupted by ponderosa pine woodlands and savannas that transition into sagebrush steppe and mixed-grass prairies.

Sagebrush steppe is dominated by various densities of Wyoming big sagebrush and mountain big sagebrush at higher elevations, with areas of silver sagebrush in the lowlands and black sagebrush and Wyoming threetip sagebrush on exposed, rocky soils. Sagebrush steppe communities are interspersed with bunchgrass/rhizomatous grass communities and allied shrubs, and generally have relatively low forb cover.

Mixed-grass prairies, including foothill-valley grasslands, are characterized by blue grama, western wheatgrass, junegrass, Sandberg bluegrass, needle-and-thread grass, rabbitbrush, fringed sage, and

various other forbs, shrubs, and other grasses. Some mountain mahogany and skunkbush sumac shrubs occur on bluffs within the study area. Perennial and intermittent streams channel through the study area, creating interspersed riparian and wetland areas. Common vegetation occurring in these areas includes peachleaf willow, coyote willow, orchard grass, foxtail, creeping bentgrass, redtop, Nebraska sedge, mountain rush, bulrush, wild mint, and red clover.

The two vegetation ecoregions in the Study Area as described by Chapman et al. (2004) are further divided into 10 vegetation classifications primarily defined by dominant vegetative functional groups and dominant species. LANDFIRE, a raster geographic information system (GIS) database of vegetation types and other spatial data layers covering the nation (U.S. Geological Survey [USGS] 2006), was used to map these vegetation types within the project area. LANDFIRE provides greater resolution of dominant vegetation cover and was used as the primary land cover, while ecoregions were identified to provide general descriptions of associated vegetation communities.

The LANDFIRE vegetation classifications are Aspen Woodland-Mixed Conifer Forest, Dwarf Sagebrush Steppe, Foothill-Valley Grassland, Mixed-Grass Prairie, Montane Grassland and Mesic Meadow, Mountain Mahogany Woodland and Montane Shrubland, Ponderosa Pine Woodland and Savanna, Riparian and Floodplain Systems, Sagebrush Steppe, and Sparsely Vegetated (Map F-8). Additional land cover includes portions of the Study Area that are either open water or areas that have been exceedingly modified by human development (i.e., developed-open space, introduced upland vegetation, and agriculture-pasture/hay). Approximately 77% of the Study Area (18,361 acres) is covered by either sagebrush steppe (including dwarf sagebrush steppe) or mixed-grass prairie (including foothill-valley grassland), while other less frequently occurring plant communities are more restricted by elevation, topography, soil, hydrology, and development (Table 6-11, Baseline Acreage). Please refer to Appendix H for detailed information on project area vegetation, including scientific names of the plant species referenced above.

Table 6-11 Temporary and Permanent Disturbance to Vegetation in Study Area.

Vegetation Type	Baseline Acreage	Temporary Disturbance (ac)	Permanent Disturbance (ac)
Agriculture - Pasture/Hay	23.1	0.0	0.0
Aspen Woodland - Mixed Conifer Forest	809.6	2.8	0.7
Developed - Open Space	1.1	0.0	0.0
Dwarf Sagebrush Steppe	5,074.0	33.0	9.8
Foothill-Valley Grassland	2,145.1	63.5	24.9
Introduced Upland Vegetation	62.4	0.0	0.0
Mixed Grass Prairie	4,672.4	65.6	23.9
Montane Grassland and Mesic Meadow	19.1	0.3	0.0
Mountain Mahogany Woodland and Shrubland	1,494.7	25.8	7.7
Ponderosa Pine Woodland and Savanna	1,788.2	25.8	3.5
Riparian and Floodplain Systems	1,269.2	2.1	0.7
Sagebrush Steppe	6,469.4	113.5	38.7
Sparsely Vegetated	5.3	0.0	0.0
Grand Total	23,833.6	332.2	109.9

Note: Rounding errors may cause column totals to vary slightly from those calculated with one significant digit.
Source: WWI 2010.

6.8.4 Construction Impacts

Construction of the proposed projects would impact about 332 acres or 1.4% of the vegetation within the study area. Following construction, temporary use areas would be reclaimed and reseeded and permanent impacts would be reduced to about 110 acres, less than 0.5% of the study area. Acreages of temporary and permanent disturbance by vegetation type are summarized in Table 6-11, below. Based on the above, construction of the proposed Projects would not pose a threat of serious injury to rare plants or vegetation in the affected area.

6.8.5 Operations Impacts

There would be no on-going impacts to vegetation or rare plants during operation and maintenance of the proposed facilities.

6.9 TERRESTRIAL WILDLIFE

6.9.1 Regulatory Jurisdiction

Within the proposed project area, jurisdiction over terrestrial wildlife is shared by the Wyoming Game and Fish Department (WGFD) and the U.S. Fish and Wildlife Service (USFWS). The WGFD has primary jurisdiction over big game (e.g., elk, mule deer, pronghorn), small game, and nongame species that are not migratory. The USFWS has primary jurisdiction over federally listed threatened and endangered species under the Endangered Species Act, migratory birds under the *Migratory Bird Treaty Act* (MBTA) and eagles under the *Bald and Golden Eagle Protection Act* (BGEPA). There are no federally listed species known to occur in the study area. Several species under the jurisdiction of the USFWS (e.g., Greater Sage-Grouse) also receive management and protection under state statutes, regulations, and policy.

6.9.2 Area of Site Influence

The study area boundary shown in Appendix F, Map F-9 comprises the area of analysis for terrestrial wildlife. The area of site influence varies somewhat by species. The area of site influence for small, less-mobile species such as amphibians and small mammals is likely limited to portions of the individual project sites in which those species occur. In contrast, the area of site influence for larger migratory species such as big game and birds could encompass the entire study area and even extend beyond the study area boundary if project development causes wildlife to be displaced to adjacent lands during construction and/or operation of PWP I and PWP II.

6.9.3 Existing Wildlife

To assess existing wildlife in the vicinity of the proposed projects, WWI contracted SWCA Environmental Consultants (SWCA) to conduct wildlife surveys in the study area. Surveys were initiated in February, 2010, with a winter bird survey of the site. Protocols for subsequent surveys were developed in cooperation and coordination with WGFD and in accordance with the agency's then draft Wildlife Protection Recommendations for Wind Energy Development in Wyoming (*Recommendations*). When the *Recommendations* were ultimately approved by the Wyoming Game and Fish Commission in April of 2010, survey protocols for the Projects were amended to reflect those specified in the final document.

The current version of the *Recommendations* document was adopted by the Wyoming Game and Fish Commission on November 17, 2010. WWI and SWCA are now working under this final version, also in cooperation and coordination with the WGFD.

To date, a variety of wildlife surveys have been conducted. Winter bird surveys were completed in February and December 2010. An aerial survey for Greater Sage-Grouse leks was conducted in April and May 2010 and followed by ground-based lek counts. Aerial raptor nest surveys were undertaken in April and May 2010. Ground-based raptor nest surveys and monitoring of nests observed during the aerial survey were conducted in May and June 2010. Surveys to document raptor and songbird use of the project area during spring migration and the breeding season were completed in May and June 2010. Fall migration surveys were conducted from August through mid-November 2010. Acoustic bat monitoring using Anabat detectors was conducted between March and mid-October 2010. Information on big game use of and migration through the study area was gathered through incidental observations during the course of the above survey efforts. Similarly, data on amphibians within the study area were collected while biologists were on site conducting other surveys.

The following subsections summarize results of these wildlife survey efforts. For detailed information on survey protocols, timing, results, and the scientific names of observed species, please refer to the Wildlife Survey Report for Pioneer Wind Parks (SWCA 2010a) in Appendix H.

6.9.3.1 Greater Sage-Grouse

Three sage-grouse leks are located within the study area, these include: the Morman Canyon lek, the Virden Creek lek, and a new lek that was found during the course of SWCA's survey efforts. The Morman Canyon lek is located within the PWP I site and was monitored by WGFD from 2000 - 2009. During that time, peak male attendance ranged from nine birds to 35 birds with a ten-year average of 19.1 birds. SWCA began monitoring the Morman Canyon lek on April 16, 2010, and conducted three lek counts between that date and May 17, 2010. Peak male attendance was seven birds on May 3, 2010.

The Virden Creek lek was monitored by WGFD in 2006 and 2009 and peak male attendance was reported as 20 birds and 23 birds, respectively, in those years. SWCA biologists began monitoring the Virden Creek lek on April 16, 2010 and conducted three lek counts between that date and May 14, 2010. Peak male attendance was 31 birds on May 3, 2010.

The new lek was found incidentally on May 13, 2010, and had a peak male attendance of seven birds observed the following day. Information on the location and status of this lek was provided to the WGFD immediately following its discovery.

In addition to the above lek counts, a total of 53 Greater Sage-Grouse were observed in the study area during migratory bird surveys, raptor surveys, and incidental sightings between mid-May and the end of September, 2010. Some of these sightings were of females and juveniles, indicating that portions of the study area are used as brood-rearing habitat. This conclusion is consistent with WGFD radio telemetry data from 2006-2007, which indicated the presence of a female sage-grouse nest in the southwestern portion of the study area and females with broods in the two proposed project sites.

6.9.3.2 Raptors

Raptor (birds of prey)-specific surveys were conducted during spring migration (April - June) and fall migration (mid-August - November). A combined total of 79, day-long surveys were completed from observation points in PWP I, PWP II, and the reference area during these periods. Over the course of these surveys a total of 1,204 raptor observations comprising 1,339 individual birds (some observations were of multiple birds) and 16 species were documented. The raptor species most commonly observed included Golden Eagles (20.0% of raptor observations), Red-tailed Hawks (18.6%), American Kestrel (13.4% of observations), and Northern Harrier (11.4% of observations). Other notable raptors documented in the study area include Ferruginous Hawk (6.0% of observations) and Bald Eagle (2.1% of observations).

Of these 1,204 observations, 693 (58%) of them were of raptors that spent a least a portion of their flight at a height above ground level within the range of the rotor-swept zone of the proposed WTGs (approximately 125 feet – 400 feet above ground level). Golden Eagles and Red-tailed Hawks were the most commonly observed raptors flying at this height. In order to determine if there were certain areas within the study area in which raptors (particularly those flying at heights within the range of the rotor-swept zone) tend to concentrate, SWCA biologists mapped the flight paths of individual birds, overlaid these observations on a grid, and color coded the grid to correspond with low (2-3), medium (4-6), medium-high (7-9), and high (10+) numbers of observations. Based on this analysis, the most concentrated use area is located just southwest of the bluffs on the south side of Willow Creek in PWP II.

In order to avoid and minimize potential impacts to raptors, WTGs have been sited outside of this concentration area.

Although the number of raptor observations noted above seems high, this is largely the result of the intensity and duration of the survey effort. In order to assess the value of the study area to migrating raptors, SWCA compared the passage rates observed at the four study area raptor observation points to documented passage rates from another site in Wyoming and one in Colorado. Spring raptor migration data was available for HawkCount's Dinosaur Ridge site along the Rocky Mountain Front Range near Lakewood, Colorado, and fall migration data was available for HawkWatch International's Commissary Ridge site in western Wyoming. Spring migration passage rates for Dinosaur Ridge have averaged 6.48 raptors per survey hour over the last six years. In comparison, the spring passage rates for PWP I and PWP II were 0.50 raptor per hour and 0.47 raptor per hour, respectively, for the spring of 2010. Based on their low passage rates relative to sites located along known raptor migration routes, the PWP I and PWP II project sites do not appear to provide important migration corridors for raptors in the spring.

Fall migration rates at PWP I and PWP II are higher. At Commissary Ridge, the 4-year average fall migration passage rate is 6.96 raptors per survey hour. Fall passage rates in the study area were calculated at 1.74 raptors per hour in PWP I and 2.20 raptors per hour in PWP II. While the study area's fall migration passage rates are substantially higher than those observed in the spring, they are still only 25% to 31% of the rates observed at Commissary Ridge. For more detailed information on raptor use of the study area including literature citations pertaining to the above data, refer to Appendix H.

6.9.3.3 Other Migratory Birds

A total of 408 migratory bird surveys were conducted in the study area between May 13 and June 30 and August 18 through November 13, 2010. In addition to the raptor species mentioned above, 79 species of birds were observed during this effort. The most commonly observed species documented during the migratory bird counts were Horned Larks (1,040 individuals in 309 flocks with a mean use of 2.55 birds per plot per survey), Vesper Sparrows (783 individuals, 489 flocks, 1.92 birds/plot/survey), Brewer's Blackbirds (612 birds, 222 flocks, 1.50 birds/plot/survey), and Western Meadowlarks (587 birds, 489 flocks, 1.44 birds/plot/survey). These species are common throughout the region.

There are no federally listed threatened or endangered bird species that occur in the State of Wyoming. Table 6-12 below lists the birds designated as Wyoming Species of Greatest Conservation Need (SGCN) that have been observed on site in order of their abundance.

Table 6-12 Avian Species of Greatest Conservation Need Observed in the Study Area During Migratory Bird Point-Count Surveys.

Species	# Individuals Observed (# of flocks)[1]	Mean Use (#birds/plot/survey)
McCown's Longspur	125 (13)	0.31
Chestnut-collared Longspur	84 (14)	0.21
Brewer's Sparrow	30 (16)	0.07
Greater Sage-Grouse	28 (13)	0.07
Lark Bunting	21 (3)	0.05
Sage Thrasher	7 (5)	0.02
Pygmy Nuthatch	2 (2)	0.00
Upland Sandpiper	2 (2)	0.00
Bald Eagle	1 (1)	0.00
Great Blue Heron	1 (1)	0.00
Merlin	1 (1)	0.00
Peregrine Falcon	1 (1)	0.00
Swainson's Hawk	1 (1)	0.00

[1] These numbers reflect only those individuals observed during migratory bird point-count surveys and do not include individuals observed during incidental sightings.

6.9.3.4 Bats

Passive acoustic (Anabat) monitoring for bats in the study area was initiated in March 2010 and proceeded through November 2010. Anabat is a bat detection system that uses a broadband microphone and data storage unit to detect and record ultrasonic sounds. Anabat uses a frequency division technique to produce sonograms that can be viewed in real time during active monitoring surveys or after-the-fact for passive monitoring surveys. These sonograms display the shape and frequency of individual bat call notes on a graph plotted against time. Bat species produce different echolocation calls based on a variety of ecological and species-specific factors. As a result, sonograms can be used to facilitate species identification. Two meteorological (met) towers in the study area (Met B and Met C) have been equipped with two Anabat units each, one near the top of the tower at a height of 50 m to monitor bats flying at elevations comparable to the WTG rotor-swept zone and one near the base of the tower (5 m) to record

bat activity closer to the ground. Met B is located in the PWP II site and Met C is located near Virden Creek approximately three miles to the west-southwest of PWP II. Met tower-based bat monitoring was supplemented with a mobile unit that was moved regularly between six sites identified as having potential for high bat use based on their habitat characteristics. Five of these six sites were located in PWP I to compensate for the lack of met tower-based units in that project site. The microphone for the mobile unit was attached near the top of a 10-ft pole and moved among the six sites at approximately two-week intervals from April 15 to October 15, 2010.

To date, results of acoustic bat monitoring in the study area indicate spring bat activity is absent in March and very low during April through mid-May (total of 9 bat passes recorded in April, 23 passes in May). Activity levels increased in late May, reaching peak summer activity during the last week of July and the first week of August (peak of 7.1 bat passes per detector-night) and again during the third week of August (peak of 5.0 bat passes per detector-night). Peak fall activity occurred on September 13 when 23.5 bat passes per detector-night were recorded. Higher levels of activity in mid-September are likely the results of bats migrating southward through the site.

Mean bat activity levels were not equal across all Met tower-based Anabats. The Met C site recorded twice the mean activity level (2.7 bat passes per detector-night) than the Met B site (1.4 bat passes per detector-night), with Met C (5 m) detecting more than twice the number of bat passes per detector-night on average than any other met-based Anabat. The contrast in bat activity level may reflect habitat differences between the two sites. For example, Met C is close to the Virden Creek corridor identified as a potentially high bat use area whereas Met B is located on a ridge away from water and thick vegetation cover.

Differences in bat activity between the 5 m and 50 m Anabats may be due to reduced insect abundance (de Jong and Ahlen 1991; Hayes 1997). The proximity of Virden Creek (and likely greater insect abundance) to Met C may explain the higher bat activity rate clearly observed for the 5 m Anabat, but also the 50 m Anabat, in comparison to both Met B Anabats.

Tree-roosting bats (*Lasiurus* and *Lasionycteris*) account for about 75% of documented fatalities at wind energy facilities (Arnett et al. 2008). Three tree-roosting species in particular are represented in mortality studies--hoary, silver-haired, and eastern red bats--with hoary bat accounting for about 50% of all fatalities. Hoary bat calls are easily distinguished from other bats species. Silver-haired and big brown

bats have echolocation calls that are distinctive from other species, but can exhibit overlapping characteristics between themselves (Betts 1998). Low frequency, hoary bat, and the silver-haired bat complex, accounted for 776 (47.0%), 110 (6.7%) and 206 (12.5%), respectively, of bat passes for the study area (Table 6). The Met B and C (50m) Anabats detected more low frequency bats than the Met B and C (5m) Anabats. This difference is expected as low frequency bat species tend to forage at greater heights above ground level than higher frequency bats due to differences in wing morphology and echolocation (Norberg and Rayner 1987). Table 6-13 lists the bat species known to occur in Wyoming that are associated with low, mid-, and high-frequency call groups.

Table 6-13 Bat Species Grouped by Characteristic Call Frequencies.[1]

Low Frequency (<30 kHz)	Mid-Frequency (30-50 kHz)	High Frequency (>50 kHz)
Hoary Bat[2]	Western Small-footed Myotis[2]	California Myotis
Silver-haired Bat[2]	Long-eared Myotis[2]	Yuma Myotis
Big brown Bat[2]	Northern Myotis[2]	
Spotted Bat[2]	Little Brown Myotis[2]	
Brazilian Free-tailed Bat	Fringed Myotis[2]	
Big Free-tailed Bat	Long-legged Myotis[2]	
	Townsend's Big-eared Bat[2]	
	Pallid Bat[2]	
	Eastern Red Bat	
	Tri-colored Bat	

[1] Species list and frequency adapted from Hester and Grenier (2005).
[2] Wyoming Species of Greatest Conservation Need.

Results of the mobile Anabat monitoring effort in PWP I indicate that the western portion of this site supports higher levels of bat activity than other portions of the site or of Met B and Met C. A peak of over 40 bat passes per survey-night were recorded at one of the detectors in this area while the other recorded a peak of 48 passes per detector-night during fall migration. The relatively high levels of activity recorded in this area is likely due to the presence of adjacent forest cover, an intermittent stream (the Jackson Fork of Little Deer Creek), and a small pond, all of which probably contribute to increased abundance of insect forage in this area. Given that the mobile units were only about 3 m above ground, it

is unknown if the elevated activity levels recorded at these units apply to heights above ground level within the range of the WTG rotor-swept zone.

6.9.3.5 Small Mammals

A variety of small mammals are known to occur in the study area. Although no systematic surveys have been conducted for these species, incidental sightings and a raptor prey-base assessment have determined that black-tailed prairie dog, Wyoming ground squirrel, thirteen-line ground squirrel, least chipmunk, red squirrel, white-tailed jackrabbit, and cottontail rabbits all occur within the study area. Of these, the black-tailed prairie dog and Wyoming ground squirrel are considered SGCN.

6.9.3.6 Big Game

Moose, elk, mule deer, and pronghorn occur in the study area on a seasonal basis. The northwestern portion of the study area is considered elk winter range and the northern portion of the study area is designated mule deer crucial winter range (Appendix F, Map F-9). The WGFD has identified a mule deer migration corridor that extends from the mountains south of the study area northeast toward lower elevations in the Duncan Ranch area. This migration corridor cuts diagonally through the study area between the PWP I and PWP II project sites.

During spring 2010 bird surveys, several herds of pronghorn and elk were observed moving generally southwestward and westward, respectively, across the study area. During fall, 2010, five fairly large groups of elk (17-150 individuals) were observed moving southward and eastward from the ridgeline on the western edge of PWP I toward Mormon Canyon Road. Three groups of pronghorn were observed moving through the area between October 15 and 28. These groups ranged in size from 13-21 individuals and were also moving generally southward and eastward through the PWP I project site (Appendix H).

6.9.3.7 Reptiles and Amphibians

During the course of other survey efforts, there were incidental sightings of bullsnake, wandering garter snake, prairie rattlesnake, tiger salamander, and boreal chorus frogs, all Wyoming SGCN, within the study area. There were also 22 incidental sightings of the northern leopard frog, also a state SGCN, in the study area. Two of these sightings were of adult frogs in upland habitat and the remainder were of adults,

subadults, and tadpoles in Willow Creek, Lone Tree Creek, and another unnamed tributary of Willow Creek to the north of Lone Tree Creek (within the PWP I project site). Willow Creek is a perennial stream. Lone Tree Creek and the other tributary are classified as intermittent streams but likely flowed for much of the year due to somewhat wetter than normal conditions.

6.9.4 Construction Impacts

6.9.4.1 Greater Sage Grouse

Potential construction-related impacts to Greater Sage-Grouse will be minimized by constructing outside of the sage-grouse lekking season (March 15 – May 15). Except for improvements to Mormon Canyon Road and two other existing dirt access roads, there will be no construction activities within a quarter-mile of the Morman Canyon Lek, located in the PWP I project site. Similarly, the only construction activity to take place within a quarter-mile of the New Lek, located in the PWP II site, will be construction of an unpaved road to access the easternmost turbine array at that site. Thus, there will be little or no direct impact to sage-grouse leks in the project area.

Although direct impacts to any sage-grouse nests in the area will be avoided by clearing vegetation outside of the sage-grouse nesting season, the loss of nearly 114 acres of sagebrush steppe habitat will reduce the amount of sage-grouse nesting and brood-rearing habitat within the project area. Disturbance associated with construction activities taking place during the summer and fall will likely cause sage-grouse to avoid the project sites while they are under construction, displacing individual birds and broods to other suitable habitats in the area.

Given that no construction activities are planned for the winter, there will be no construction-related impacts to sage-grouse wintering on the site.

6.9.4.2 Raptors

Raptors are not expected to be adversely affected by construction of the two proposed Projects. Out of the six inactive raptor nests found during the 2010 survey effort, only one of these (an American Kestrel nest) is located within 1,500 feet of the current proposed transmission line corridor and none are located within areas that would be cleared for construction of the transmission line or WTGs. Should any nests

be found along the transmission line corridor in 2011, no vegetation clearing will occur while the nest is active and, where feasible, the line will be rerouted to avoid nest removal.

Although construction will result in some habitat loss and construction activity may preclude raptors from hunting in the immediate vicinity of each of the Projects while they are under construction, these disturbances are not anticipated to pose a threat of serious injury to populations of migrating or resident raptors in the area.

6.9.4.3 Other Migratory Birds

Direct impacts to migratory birds that nest in the project area will be minimized by clearing vegetation along access roads, WTG locations and crane pads, the O&M building site, concrete batch plant site, and temporary parking and laydown areas outside of the avian breeding season. Consequently, construction of the Projects will have no direct impact on migratory bird nests or eggs. Although 332 acres of vegetation will be cleared during construction, and thereby rendered largely unsuitable as bird habitat, this areas represents just over one percent of the habitat available within the study area. Consequently, the effects of this habitat loss on migratory birds is likely to be negligible.

Disturbance resulting from increased vehicle and heavy equipment traffic, human activity, and associated dust and noise will likely preclude most migratory birds species from nesting and foraging within the immediate vicinity of the two project sites while they are under construction. Given the prevalence of high quality, undisturbed habitats elsewhere in the study area and general vicinity, the temporary displacement of birds from the construction sites is not expected to cause substantive adverse impacts to these species.

6.9.4.4 Bats

With the exception of the transmission line corridor, the majority of proposed facilities would be located away from potential bat use areas such as forests, woodlands, and riparian areas (Appendix H). Potential impacts to tree-roosting bats resulting from tree removal along the transmission line corridor and a few of the northwestern-most WTG locations in PWP I will be minimized by clearing vegetation in the early spring and/or late fall when migratory bats are not present in the area. Furthermore, construction

activities will take place during daylight hours when bats are not active. Consequently, construction of the proposed Projects is expected to have minimal impacts on bats.

6.9.4.5 Small Mammals

Small mammals, particularly less mobile species, are likely to be adversely impacted by construction of the two Projects. Mice, voles, and other burrowing mammals such as gophers and ground squirrels are unlikely to be able avoid impacts from construction vehicle traffic, vegetation and topsoil clearing, road compaction, and excavation activities. Although individuals of these species could be lost during construction, given their prevalence in the landscape and high reproductive rate, these impacts are not likely to affect populations of small mammals in the study area or region.

6.9.4.6 Big Game

Located in the foothills, the majority of the study area comprises transitional range that is used by big game species primarily during migration between lowland winter range to the north and high-elevation summer range to the south. Given that no construction activity will take place in the spring, spring migration will not be affected by construction of the two Projects.

There is little big game use of the project area during the summer, so construction activities that take place during the summer months will have little effect on these species. Those individuals that are in the area are likely to simply avoid areas with construction activity and instead forage in riparian zones and upland habitats not affected by project construction.

Fall migration could be affected by project construction. Big game migrating northward through the study area are likely to avoid passing through areas with high levels of construction activity. It should be noted that WGFD's mapped mule deer migration route (Appendix F, Map F-9), passes between the PWP I and PWP II projects sites. This corridor will remain free of direct disturbance during the construction of both projects. Thus, provided they are not disturbed by construction activities occurring over one-half mile away and largely screened by topography, animals using this route will be able to continue to do so unimpeded by construction activities. Fall migrants that typically move through one of the two project sites will likely use other routes to access winter range during the single migration season

when there is construction activity occurring at a given site. This displacement is not expected to adversely affect these individuals or the population as a whole.

In accordance with WGFD's Recommendations, no construction activities will occur from November 15 to April 30 in portions of the study area designated as elk winter range and mule deer crucial winter range. As a result of observing this timing restriction, construction impacts to wintering elk and mule deer will be avoided and minimized.

6.9.4.7 Reptiles and Amphibians

Construction activities could adversely affect individual reptiles and amphibians located in upland habitats during vegetation and topsoil clearing and excavation for access roads, WTG foundations and other facilities. These impacts are not expected to affect populations of these species in the study are or region.

None of the proposed facilities will be located within one-quarter mile of Willow Creek. Consequently, potential impacts to breeding habitat for the northern leopard frog and other amphibians along this perennial stream will be avoided. While there will be construction within a quarter-mile of Lone Tree Creek and another, unnamed tributary known to support northern leopard frogs, PWP I, LLC and PWP II, LLC will ensure that existing and rebuilt stream crossings are adequate to support heavy machinery and that BMPs are implemented such that there is little or no potential for erosion from exposed soils to contribute sediment to these intermittent waters.

6.9.5 Operations Impacts

Operation of the two proposed Projects has the potential to affect wildlife species in various ways, some of which are not currently known. Potential effects are summarized by species group below.

6.9.5.1 Greater Sage Grouse

The effects of wind energy development on Greater Sage-Grouse are largely unknown. Except during migration (and most populations are non-migratory), sage-grouse rarely fly as high as the rotor-swept zone of the proposed WTGs. Thus, direct mortality resulting from being struck by a turbine blade is

unlikely. Adverse effects are more likely to result from habitat alteration. Large scale natural gas development and operations have been shown to cause declines in sage-grouse numbers in the vicinity of facilities over time (e.g., Lyon and Anderson 2003). However, operation of a wind energy facility does not result in the same level of habitat loss and fragmentation and does not require nearly the frequency of vehicle traffic as natural gas facilities (Johnson and Holloran 2010). On the other hand, sage-grouse tend to prefer grass and shrub-dominated habitats and it is possible that the placement of tall vertical structures in such habitats could degrade their value to sage-grouse.

The adverse effects of operating the two Projects will be minimized by locating WTGs over one-quarter mile from sage-grouse lek perimeters. Although the long-term effect of the Projects on sage-grouse is unknown, PWP I, LLC and PWP II, LLC will monitor sage-grouse lek attendance for a minimum of three years post construction to determine if operations are having a measurable effect on this species.

6.9.5.2 Raptors

Raptors have potential to be directly affected by project operations. To the extent that migrating or resident raptors fly through the PWP I and/or PWP II project sites at an elevation above ground comparable to the rotor-swept zone, these species have potential to be struck and injured or killed by spinning turbine blades.

In order to avoid and minimize the potential for such impacts, SWCA mapped observed raptor flight paths through the two project sites and an adjacent reference area (Appendix H). Ridgelines and areas with the highest observed raptor concentrations (10 or more observations of all raptor species, four or more observations of Golden Eagles) at flight heights approximating the proposed rotor-swept zone have been excluded from consideration for WTG locations. As prairie dogs are an important prey for various raptors and will therefore attract them, WTGs have also been located away from white-tailed prairie dog colonies. Locating turbines away from these concentrated prey resources will help reduce the risk to raptors foraging in and adjacent to the project sites.

Despite these siting considerations, there remains potential for individual raptors to be adversely affected by project operations. Though a detailed collision-risk model has not been developed for the site, results of fatality monitoring at another wind energy facility in Wyoming have documented post-construction raptor fatality. At the Foote Creek Rim wind farm in Carbon County, raptor mortality estimates have

been calculated at 0.035 raptors per turbine per year or 0.053 raptors per MW per year (Erickson et al. 2005). To the extent that these rates are generally applicable to the proposed Projects, they would equate to 1.1 - 2.6 raptor mortalities per project per year. These rates are not expected to have a discernible effect on raptor populations in the study area or region. Nevertheless, PWP I, LLC and PWP II, LLC will conduct fatality monitoring throughout both project sites for a minimum of three years following commencement of operations. Should the level of raptor mortality be a concern, suitable mitigation will be determined in consultation with WGFD and USFWS.

6.9.5.3 Other Migratory Birds

Migratory songbirds are far more common in the study area than raptors and they comprise the vast majority of bird species killed at existing wind energy facilities. Most of North America's songbirds migrate at night at altitudes well above the rotor-swept zone of WTGs when the weather is favorable. When the weather is poor, migrating songbirds are at greater risk of colliding with wind turbines and met towers if forced to fly at lower altitudes due to fog or low cloud cover. They also may be at greater risk during take-off and landing where wind energy facilities are located immediately adjacent to migratory stopover sites (NWCC 2010). As a result, songbird casualties tend to peak in the spring and fall at wind energy facilities.

Total bird casualties at Foote Creek Rim have been documented at 1.50 fatalities per turbine per year or 2.34 fatalities per MW per year (Erickson et al. 2005). Roughly three-quarters of these fatalities comprise songbirds (NWCC 2010). Were these rates applicable to the PWP I and PWP II project sites, approximately 35 to 88 songbirds could be expected to be killed at each of the proposed Projects per year. However, these rates may not be applicable to the PWP I and PWP II project sites. The Foote Creek Rim wind energy facility is located between two riparian corridors and immediately west (upwind) of the large Rock Creek riparian corridor that contains extensive ponds and wetlands that likely act as migration pathways and stopover points for migratory birds. Thus, the rate of migratory bird casualties at that site is likely to be substantially higher than the PWP I and PWP II project sites, which are not located near any major north-south oriented riparian zones or stopover sites. Although songbird casualties are not expected to approach those recorded at Foote Creek Rim, some mortality will undoubtedly occur at PWP I and PWP II. The fatality rate will be determined through post-construction monitoring. Mitigation, if required, will be determined in coordination with WGFD and USFWS.

It should be noted that the number of bird fatalities at wind energy facilities is several orders of magnitude lower than the estimated impacts of other human-caused sources of bird mortality such as vehicles, buildings and windows, communication towers, pesticides, and feral and domestic cats (Erickson et al. 2001, Erickson et al. 2005). Consequently, current WTG-related bird mortality rates are unlikely to affect population trends of most North American songbirds (NAS 2007). Similarly, operation of the proposed Projects is unlikely to have a substantive effect on populations of songbirds and other migratory birds in the study area and region.

6.9.5.4 Bats

Bats are most prevalent in the study area during the late summer and early fall, which coincides with the migration period for most species. This is the period when bats are most likely to be impacted by operating WTGs. Recorded bat fatalities at wind farms tend to be considerably lower in the West than they area at eastern facilities. The only publicly available information on bat fatality rates in Wyoming is again from the Foote Creek Rim facility in Carbon County. Recorded bat fatalities at Foote Creek Rim have ranged from approximately 1 - 4 fatalities per MW per year, whereas sites in West Virginia and Tennessee have had documented fatality rates between 30 and 40 bats per MW per year (NWCC 2010). Bat mortality at the proposed Projects will be documented during post-construction monitoring. Because the site is largely non-forested and is not located adjacent to a major riparian corridor, bat mortality rates are expected to be lower than those observed at Foote Creek Rim. Nevertheless, if post-construction monitoring determines that bat mortality is a concern, suitable mitigation will be determined in consultation with WGFD and USFWS.

6.9.5.5 Small Mammals

O&M vehicle traffic and increased local and tourist traffic could result in a minor increase in incidental mortality of small mammals crossing PWP I and PWP II access roads. This level of mortality is not expected to be a substantive increase over existing levels. Operation of the proposed Projects is therefore unlikely to have any adverse effect on populations of small mammals within the two project sites.

6.9.5.6 Big Game

Project operations are expected to have little or no effect on big game use of the project sites. Following construction of the two Projects, approximately 222 acres of temporary use areas will be reclaimed and

revegetated, providing high quality forage for big game moving through and foraging in the area. Although approximately 110 acres will remain disturbed or developed, this loss of habitat comprises less than 0.5 percent of the study area and its effects on big game are likely to be negligible.

Similarly, there will be minimal activity on the project sites during operation. O&M activities are expected to cause only sporadic and incremental increases in traffic levels over current traffic volumes, though there could be an unquantifiable increase in traffic resulting from locals taking advantage of improved road conditions to drive the Mormon Canyon - Box Elder Canyon loop tour and tourists interested in viewing the Projects up close. Some big game species or individuals may avoid traversing through the project sites due to increased tourist traffic, O&M activities, and/or the operation of the WTGs themselves. Big game avoidance of the sites, should it occur, is not expected to have a substantial adverse effect on local populations of these species.

6.9.5.7 Reptiles & Amphibians

O&M vehicle traffic and increased local and tourist traffic could result in a minor increase in incidental mortality of reptiles and amphibians crossing PWP I and PWP II access roads. This level of mortality is not expected to be a substantive increase over existing levels. Operation of the proposed Projects is therefore unlikely to have any adverse effect on populations of reptiles and amphibians within the project sites.

6.10 FISHERIES

6.10.1 Regulatory Jurisdiction

The WGFD has primary jurisdiction over sport fisheries in the State of Wyoming. The USFWS has jurisdictional authority over threatened and endangered fish species, but there are no known federally listed fish species in the vicinity of the study area.

6.10.2 Area of Site Influence

For fisheries resources, the area of site influence comprises the intermittent and perennial streams within the study area (Appendix F, Map 6).

6.10.3 Existing Fisheries

WGFD biologists surveyed four stream segments within the study area during the summer of 2010. Stream sites sampled within the study area included reaches of Willow Creek, Lone Tree Creek, Gross Creek, Alphin Draw, and Virden Creek. Additional reaches will be sampled in 2011.

At each survey site, WGFD biologists established an electrofishing station of sufficient length to capture all aquatic habitat types present (riffle, run, pool, undercut bank, etc.) in at least triplicate. Two or three passes were made per reach to count salmonids that were 1 year of age and older. Age 0 (i.e., young of the year) salmonids and non-game species were counted on the first pass only due to problems of capture efficiency on small fishes. WGFD intends to estimate population and biomass of these samples in early 2011. Information currently available from these surveys includes the species and habitat present in each reach. This information is summarized for each of the sampled reaches below.

6.10.3.1 Willow Creek

Fish species present in this reach, located just downstream of the Lone Tree Creek and Gross Creek confluences and between the PWP I and PWP II project sites, included brook trout, white sucker, and creek chub. Age 0 brook trout were present in moderate numbers. Salmonid spawning habitat is somewhat limited in this reach due to silt loading from a road that parallels the stream and from eroding banks. The stream shows evidence of downcutting and may be susceptible to further degradation from changes in runoff patterns.

6.10.3.2 Lone Tree Creek

This tributary of Willow Creek flows west and south through a portion of the PWP I site to its confluence with Willow Creek. The surveyed reach was located approximately 0.37 mile upstream of the confluence and contained brook trout and creek chub; age 0 brook trout were abundant. The stream contains extensive areas of suitable salmonid spawning habitat, which likely explains the abundance of age 0 fish. Lone Tree Creek is likely an important spawning tributary for brook trout in the Willow Creek watershed. Any increase in sediment loading to this stream could be detrimental to brook trout recruitment in this watershed.

6.10.3.3 Gross Creek

This tributary of Willow Creek flows northeastward, along the edge of the PWP II project site to its confluence with Willow Creek just upstream of the Lone Tree Creek confluence. WGFD surveyed the reach approximately 360 ft upstream of the Willow Creek confluence. Fish species present in this reach were limited to brook trout. Most of the fish caught were of older age classes; there were only four age 0 fish captured in this reach. This stream segment surveyed was characterized by old beaver ponds and a silt/sand substrate.

6.10.3.4 Virden Creek

This tributary to Box Elder Creek runs generally westward on the south end of the study area, south of the PWP II project site. The surveyed reach was located approximately 1.25 mile upstream of the Strawberry Creek confluence. Species present were limited to adult brook trout in very low numbers, likely owing to the multiple irrigation diversions in this area contributing to seasonal dewatering of the stream. This reach is upstream of the proposed project sites and would not be affected by project implementation.

6.10.3.5 Alphin Draw

Species present in this reach, which is located in the southwestern portion of the study area, were limited to brook trout and creek chub. Age 0 brook trout were found to be extremely abundant in this area and the spawning habitat appeared to be excellent. Although located within the study area, there are no Project facilities planned for this sub-watershed, thus there would be no impact to fisheries in Alphin Draw.

6.10.3.6 Duck Creek

Three reaches of Duck Creek upstream of Deer Creek were surveyed by WGFD in 2010. The lowest elevation reach, just upstream of the confluence, contained brook trout, brown trout, rainbow trout, creek chub, longnose dace, and white sucker. This reach is outside of and to the west of the study area boundary. The middle site is located just inside the study area near the confluence of Alphin Draw. It contained brook trout, brown trout, and creek chub. The upper site is located approximately 0.50 river mile downstream of the large wetland complex that comprises the headwaters of Duck Creek. This reach

contained brook trout and creek chub only. Like Alphin Draw, this stream is located in the Middle Deer Creek - North Platte River sub-watershed (Appendix F, Map 6). There are no facilities proposed to be located in this sub-watershed. Thus, project implementation will have no effect on Duck Creek.

6.10.4 Construction Impacts

Construction activities have the potential to impact aquatic habitats and fisheries through hazardous material spills, erosion, and sedimentation. PWP I LLC and PWP II, LLC's EPC contractor will prepare a stormwater pollution prevention plan (SWPPP) in accordance with WDEQ regulations. The SWPPP will require secondary containment of hazardous substances such as diesel fuel and chemical admixtures used in concrete production and these sites will be located in uplands, well away from area streams. Construction BMPs will ensure that soil erosion on disturbed sites such as WTG locations, crane pads, and temporary laydown areas is confined to those areas and does not result in sediment reaching perennial and intermittent streams or ephemeral washes.

As described in Sections 6.4.4 and 6.4.6, above, a RLA completed for the study area determined that two of the sub-watersheds in which the Projects are located, the Box Elder Creek – Hunton Creek and Box Elder Creek - Virden Creek subwatersheds, are currently considered "at risk" for impacts to aquatic life resulting from erosion and sedimentation of stream channels (Appendix H). Existing road crossings of Lone Tree Creek, Willow Creek, Gross Creek, and Virden Creek are in poor condition and are impacting adjacent aquatic habitats. Prior to initiating construction, the existing culverts at these crossings will be reset or redesigned and replaced in order to improve stream flows and minimize erosion and sedimentation. PWP I, LLC and PWP II, LLC and their EPC contractor(s) will conduct a pre-construction onsite visit and yearly post-construction onsite visits with WGFD and DEQ personnel to ensure that BMPs outlined in the SWPPP are working as designed. As per WGFD Recommendations, if any problems are observed, the WGFD will provide recommendations to fix the problems. If the problems are not fixed in a timely manner, the WGFD may recommend that additional monitoring be conducted. It is expected that, as a result of these measures, construction of the proposed Projects will have little or no impacts on fisheries and other aquatic resources.

6.10.5 Operations Impacts

Operation of PWP I and PWP II will have no effect on fisheries within the area of site influence.

6.11 SCENIC RESOURCES

Scenic (i.e., visual or aesthetic) resources are the natural and man-made features of the landscape that contribute to the public's experience and appreciation of the environment. Impacts to scenic resources are generally defined in terms of a project's physical characteristics and potential visibility and the extent to which the project's presence would change the perceived visual character and quality of the environment in which it would be located. This analysis documents the existing visual conditions on-site and in the surrounding area and assesses the extent to which the proposed project has the potential to affect valued qualities of the area's scenic resources.

6.11.1 Visual Conditions On-site and the Surrounding Area

The PWPI and PWP II project sites are located in a rural area of southwestern Converse County. The area is primarily used for livestock grazing. Within 10 miles of the project area are the town of Glenrock, private residences, gravel pits, oil and gas wells, two railroad lines, several pipelines, the Dave Johnston Power Plant, numerous power lines, agricultural operations, and numerous paved and unpaved roads (including county roads, U.S. Highway 30, and Interstate 25).

The Projects are proposed to be located in a combination of private fee lands and State Trust Lands in the foothills south of Glenrock. The project area is characterized by rolling topography dissected by one perennial stream (Willow Creek) and a variety of ephemeral and intermittent stream channels. The terrain around the project sites varies from approximately 6,500 to 7,040 ft above mean sea level in elevation. The area is primarily used for livestock grazing and is primarily covered with grasses and small areas of sagebrush and other shrub vegetation. There are some trees in the project area, but the site is primarily open in character. There are no developed features in the project area except for the gravel quarry on Mormon Canyon Road, several unoccupied ranch houses, several dirt roads, and barbed wire fencing. The existing landscape on-site is typical of the larger region and does not include landscape resources that are unusual, serve as regional focal points, or have been given special recognition or protections. For example, no specific state or local planning policies or ordinances were identified that pertain to permissible levels of visual alteration of privately owned lands in the project area.

6.11.2 Assessment of Potential Impacts to Scenic Resources

WWI used two standard methods to assess the potential impacts of the Projects on local visual resources. The first method is a viewshed analysis that involves the use of geographic information system (GIS) data to determine the areas within a specific distance of the Projects from which turbines would or would not be visible to an observer on the ground. The second method is a visual simulation approach where GIS computer software is combined with base photographs to produce a simulation of what the project would look like from a specific location near the project. These methods are described in more detail in the sections below.

6.11.2.1 Viewshed Analysis

To analyze the visual effects of the wind turbine layout, it is important to identify the areas from which the proposed wind turbines would and would not be visible. This analysis was performed by WWI using the viewshed feature associated with the ArcInfo GIS program. The analysis uses the elevation value of each grid cell of the digital elevation model (DEM) to determine visibility to or from a particular cell or location. A viewshed is created from a DEM by using an algorithm that estimates the difference of elevation from one cell (the viewpoint cell) to the next (the target cell). To determine the visibility of a target cell, each cell between the viewpoint cell and target cell is examined for line of sight. Where cells of higher value are between the viewpoint and target cells, the line of site is blocked. If the line of sight is blocked, then the target cell is determined to not be part of the viewshed. If it is not blocked, then it is included in the viewshed.

The algorithm is also based on a given set of variables for this type of analysis. When performing a viewshed analysis, several variables are used to limit or adjust the calculation. For an analysis to determine the visibility of a wind turbine, the height of the tower plus turbine blade length (combined total of approximately124 meters) is used as an offset variable. The offset value is added to the topographic elevation value of the cell to obtain the corrected elevation of each wind turbine. The final variable used in the viewshed analysis is the radius value. For this viewshed analysis, the radius variable was set to 10 miles. The GIS software then analyzes each cell to determine if one or more wind turbines would be visible from each cell within 10 miles of a turbine. The software then combines all of the cells that are visible to create a GIS viewshed coverage that is overlaid on a basemap for illustrative purposes (Kim et al. 2004).

The results of the WWI viewshed analysis are presented on Figure 6-1. The analysis indicates areas where any portion of any of the proposed wind turbines up to blade tip at top dead center would be potentially visible. This analysis takes into account the role that topography plays in shielding or blocking views toward the wind turbines. Review of Figure 6-1 indicates that the projects will be visible from approximately 26.6% of the area within 10 miles of the projects' area for the identified wind turbine layout. However, it is important to note that the viewshed analysis did not take into account native vegetation such as trees or shrubs or the presence of buildings, which, depending on location and topography, can affect the outcome of the analysis. Therefore, in reality, the results of this analysis overestimate the amount of area from which the wind turbines could be visible due to number and location of trees and taller vegetation and/or buildings located in the line of sight between the observer and wind turbines within the project area.

6.11.2.2 Visual Simulation

The proposed two Projects' major features are described in Section 2.0, and their most visible features are the WTGs. WWI listened to community input about vantage points that local residents are most concerned with, including the town of Glenrock and Interstate 25 (I-25), and had visual simulations prepared from seven of these vantage points, known as key observation points (KOPs). KOPs from which views of the projects were assessed include: I-25/Deer Creek Road Off Ramp (KOP 1); Intersection of Box Elder and Mormon Canyon Roads (KOP 2); Rural Box Elder School (KOP 3); Deer Creek Community Hall (KOP 4); a point representing the Town of Glenrock taken from the Glenrock Recreation Center (KOP 5); Box Elder County Park (KOP 6); and a location near a group of cabins to the south of the project area (KOP 7). The locations of the seven KOPs are illustrated on Figure 6.1. In addition, the locations of the seven KOPs were displayed at the community open house in Glenrock on November 9, 2010.

WWI chose the seven KOP's based on two primary considerations:

1) Community input - three KOPs were chosen based on input from community residents and local governing bodies who consistently asked whether the turbines would be visible. These included I-25, the Town of Glenrock and Box Elder County Park. The wind turbines are visible from the I-25 KOP but they were not visible from the Town of Glenrock and Box Elder County Park KOPs.

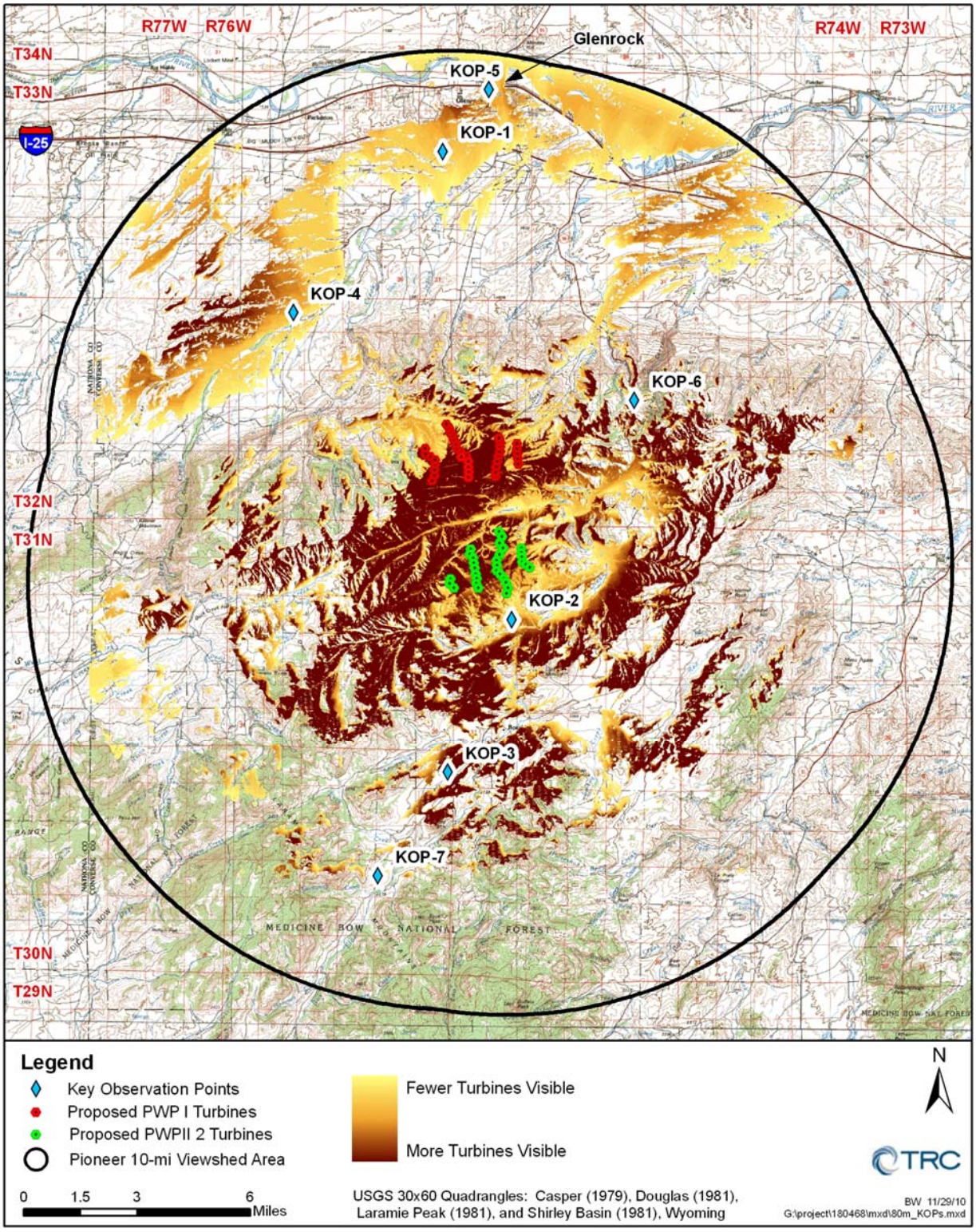

Figure 6-1 Results of Viewshed Analysis and KOP Locations, Pioneer Wind Park Project.

2) Areas within or adjacent to the proposed projects where homes are located or that are popular places to county residents. These included the intersection of Box Elder and Mormon Canyon Road (used by the community on weekend drives), the Deer Creek community Center and several homes located northwest of the project area, the Box Elder rural school located south of the projects, and an area containing several cabins located southwest of the projects.

A third-party consultant, TRC Environmental Corporation (TRC) took the base (i.e., before) photographs and prepared the photo simulations. The base photographs were taken on October 22, 2010. In addition to taking the base photograph, TRC also documented the specific location and elevation of the camera at each KOP using a Trimble GeoExplorer 3 correctable handheld global positioning system (GPS) unit along with three reference points that were marked and visible in each photograph. TRC's photographer used a tripod and Canon Rebel XSi digital camera with a Canon EFS18 55 lens, and the lens was set at 31 mm to compensate for crop factor (31 mm lenses setting X 1.6 crop factor = 49.6 mm output view); thereby creating a 50 mm equivalent focal length. The 50-mm equivalent focal length produces a 38.6° horizontal field of view, which best represents the human visual perception (National Research Council 2007).

To create the simulations, TRC's visual simulation specialist used 3DS Max 9 visualization software to locate and correctly dimension the model of the proposed project components (i.e., the WTGs) into the photographic image from each viewpoint location. A 3-D model of the wind turbines was also created in the visualization software program based on engineering specifications for the proposed turbine to be used for this project (the GE 1.6 MW xle wind turbine). The model was then incorporated into the UTM

Zone 13, NAD 83 coordinate system and placed at the easting and northing specified by the project engineering drawings.

The model and placement of the wind turbines within the visualization software was further developed to position the viewer at the selected vantage point, and the camera view was adjusted so it matches the actual photograph and the reference points. The camera position was entered into the model using data collected with the GPS equipment. The software "camera view" focal length was then set to 49.6 mm to replicate the camera conditions in the field and to be representative of the approximate view of the human eye. As such, relative dimensions in the model were proportionally represented. The coordinates of the

reference locations were used to assist with placement of the wind turbines within the photograph. Additionally, a terrain analysis using a digital elevation model of the project area was performed, and a 3-D model of the area was generated and used as an object for model refinement. Final adjustments to the placement of the wind turbines were made using the terrain analysis and the coordinates of the reference locations from each KOP using data collected with GPS equipment. The shading or color density of the simulated wind turbines is automatically adjusted by the software to account for the date and time that each photograph was taken. TRC's photosimulation specialist reviewed each photosimulation and made any necessary adjustments to placement and photographic rendering of the wind turbines.

The photographic results of the TRC visual simulations are presented below. Turbines will be visible from four KOPs (KOP 1-4), but from three of those four vantage points, the turbines will be barely visible. From the remaining three KOPs (KOPs 5, 6, and 7) no wind turbines will visible and photosimulations were not prepared. Figures 6-2, 6-4, 6-6, and 6-8 are the base photographs (without the wind turbines), and Figures 6-3, 6-5, 6-7, and 6-9 are the visual simulations, including the proposed wind turbines prepared by TRC. The photographs are paired together on the same page for easier comparison.

6.11.2.3 Summary of Potential Impacts to Visual Resources

Based on the results of the viewshed analysis and photosimulations, it is likely that only a few of the proposed wind turbines would be visible from either Glenrock or I-25. The wind turbines that are shown on Figure 6-3 are located closest to Glenrock and I-25; however, these turbines will be located far enough south of the crest of closest ridge so that only the blades and nacelles of nine of the wind turbines will be visible from these locations. In other words, natural terrain will hide most of the wind turbines and none of the wind turbines would be completely skylighted along the top or crest of the ridge. In addition, the town of Glenrock is approximately 9 miles away from the closest wind turbines, I-25 is approximately 7 miles away from the closest wind turbines, and the wind turbines will likely not attract a lot of attention from the casual observer. Therefore, as a result of distance and topographic masking (i.e., hiding), very few wind turbines would be visible to the majority of the public in Glenrock and on I-25 and only portions of those wind turbines would be visible.

In addition, the wind turbines associated with the PWP I and PWP II Projects will not impact the scenic resources in a majority of the viewshed area. Within the 10-mile viewshed, no wind turbines will be visible from 73.4% of the area and conversely wind turbines will be visible from only 26.6% of the area

Figure 6-2 KOP 1, I-25/Deer Creek Road Eastbound Off Ramp (Without Turbines).

Figure 6-3 KOP 1, I-25/Deer Creek Road Eastbound Off Ramp (With Turbines).

Figure 6-4 KOP 2, Intersection of Box Elder and Mormon Canyon Roads, Looking North (Without Turbines).

Figure 6-5 KOP 2, Intersection of Box Elder and Mormon Canyon Roads, Looking North (With Turbines).

Figure 6-6 KOP 3, Rural Box Elder School, Looking North (Without Turbines).

Figure 6-7 KOP 3, Rural Box Elder School, Looking North (With Turbines).

Figure 6-8 KOP 4, Deer Creek Community Hall, Looking Southeast (Without Turbines).

Figure 6-9 KOP 4, Deer Creek Community Hall, Looking Southeast (With Turbines).

(refer to Figure 6-1). In addition, because of the amount of topographic relief inside and outside of the project area, the full project area will not be visible at any one location. Based on where the specific turbines would be located, more turbines are likely to be visible to traffic on the southern 7 miles of Mormon Canyon Road than to traffic on Box Elder Road (refer to Figure 6-1), but only portions of one or two turbine strings will be visible at any one location.

Federal Aviation Administration (FAA) regulations require that WTGs being painted white and conform to marking and lighting specifications for aircraft avoidance. In accordance with FAA regulations, all of the wind turbines (towers, turbines, and blades) will be colored white for daylight marking/visibility. According to FAA Advisory Circular AC 70/7460-1K (FAA 2007), use of nonwhite turbines appears to be significantly less effective in providing daytime warning and would require daytime and nighttime lighting of all of the Projects' wind turbines with medium intensity white strobes, which would be more visually intrusive than white towers with no daytime lighting (personal communication, August 12, 2009, with Michael Blaich, FAA, Fort Worth, Texas). Therefore, the use of white WTGs with no daytime lighting would result in reduced visual impacts relative to nonwhite wind turbines equipped with daytime lighting (personal communication, August 12, 2009, with Michael Blaich, FAA, Fort Worth, Texas).

To minimize nighttime lighting required for the proposed Projects, PWP I, LLC and PWP II, LLC will install a lighting control system. This will be a FAA-approved audio-visual warning system (AVWS). AVWS's are a new type of nighttime lighting and audio warning system that is radar-based and is only activated by approaching aircraft. When a low-flying aircraft is detected, lights on the wind turbines are turned on and pilots receive an audio radio warning. After the aircraft is out of range, the lights are turned off and the audio radio warning is discontinued. A key advantage of such systems is that there are no permanent nighttime lights on any of the wind turbines. As a result, light pollution is minimized and the darkness and the natural character of the rural environment is maintained, except when the system is activated by a low-flying aircraft

As documented above, the Projects have been designed to minimize impacts to visual resources as much as practical. There are a considerable amount of existing man-made intrusions within 10 miles of the project area, much of proposed Projects will be obscured or hidden by topographic relief, and PWP I, LLC and PWP II, LLC will implement a radar-based control system that minimizes nighttime lighting of the wind turbines. As a result, the Projects will not pose a threat of serious injury to the visual

environment or to the social and economic condition of present or expected inhabitants in the area of site influence.

6.12 CULTURAL RESOURCES

6.12.1 Regulatory Jurisdiction

The *National Historic Preservation Act* (NHPA) is the principal federal law guiding the treatment of archaeological resources (including pre-historic and historic sites and artifacts) in actions authorized, funded, or carried out by federal agencies or located on federal lands. Given that there are no federal lands or permits required for construction of the proposed Projects, the NHPA does not apply. Similarly, there are no state laws specific to the protection of cultural resources on private lands. The ISA (W.S. 35-12-109(a)(xiii)(C)) requires that Section 109 permit applications evaluate potential impacts to archaeological and historic resources.

6.12.2 Area of Site Influence

The area of site influence for cultural resources is limited to the footprint of the proposed facilities and temporary (construction-related) use areas. WWI contracted with SWCA Environmental Consultants to conduct block surveys around proposed facility locations, which would allow WWI to relocate facilities to avoid impacting cultural sites without requiring additional surveys. Refer to Appendix F, Map F-10 for a depiction of the cultural resources survey area.

6.12.3 Cultural Resources in the Project Sites

SWCA conducted a Class III inventory of 2,684 acres in two survey blocks corresponding with the two proposed project sites, a 6-acre block for the proposed interconnect substation, a 4.8-mile transmission corridor, and 2.75 miles of access roads.

Seventeen sites and 34 isolated resources were newly recorded within the survey area. One of these sites is recommended eligible for nomination to the National Register of Historic Places (NRHP); six are recommended not eligible for the NRHP; and 10 remain unevaluated regarding NRHP eligibility. Refer to Appendix I for a detailed report describing the cultural history, results of the Class I archival literature

review, inventory methods, and findings. Note that due to concerns about damage to these specific locations, information relating to specific locations of sites and artifacts has been removed from this copy of the report. A complete, unabridged version of the report has been sent to the Wyoming State Historic Preservation Office (SHPO) for review.

6.12.4 Construction Impacts

No cultural resources will be affected by the proposed Projects. The locations of archaeological sites, buffered by 100 feet, were taken into consideration during project design and WTGs and access roads were sited to avoid impacts to these features.

6.12.5 Operations Impacts

Operation of the Projects will have no effect on cultural resources.

6.13 RECREATIONAL RESOURCES

This section examines community recreational facilities, urban outdoor recreational opportunities and outdoor resource-oriented recreational opportunities that exist in the area of site influence. This section also describes any anticipated impacts on the recreational facilities by the proposed Pioneer Wind Park during construction and operations.

6.13.1 Area of Site Influence

The area of site influence for recreational resources is generally equivalent to the recommended area of site influence for socioeconomic resources, i.e., south-central Converse County and eastern south-central Natrona County and the communities of Glenrock, Douglas, and Casper.

6.13.2 Recreational Facilities and Outdoor Recreational Opportunities

No developed public parks or recreation facilities exist within the study area boundary. The study area overlaps the northeast portion of the Deer Creek Hunter Management Area (HMA). However, only a small portion of the PWP I project site overlaps this HMA. Hunter Management Areas (HMA) are

parcels of land where the Wyoming Game & Fish Department facilitates management of hunters for access to hunt. The area may refer solely to private lands or a combination of private, state trust land and federal land within ranch boundaries. All hunters who wish to hunt these access areas must obtain a printed permission slip. The Duncan Ranch HMA is located immediately adjacent to and north of the study area. A southerly portion of the study area overlaps private holdings within the Medicine Bow National Forest. The Projects have been designed to avoid construction of any facilities on these holdings and recreational uses will not be affected. The nearest proposed turbine locations are located in PWP II, approximately 2.3 miles northwest of the Forest boundary. The Medicine Bow National Forest can be accessed by traveling via the Box Elder Road south of the project area, though there are no developed recreational facilities located in that part of the forest.

Several public town parks, recreation facilities and two county parks exist within ten miles of the study area in Glenrock and the surrounding area. Additional public parks, recreation facilities and outdoor recreational opportunities including city, state and county parks and attractions exist beyond 20 miles from the study area in the cities of Douglas and Casper.

Table 6.14 lists town parks, recreational facilities and outdoor recreation opportunities within an approximately 10 mile vicinity of the Pioneer Wind Park I and Pioneer Wind Park II. These recreational opportunities are illustrated on Map F-11 in Appendix F.

6.13.3 Additional Recreational Facilities and Outdoor recreational opportunities in Converse and Natrona Counties

Many recreational resources exist in Converse and Natrona Counties that provide opportunities to golf, hike, ski, swim, watch wildlife, fish, picnic, camp, hike, mountain bike, and hunt in the region of the proposed Projects. In the towns of Casper and Douglas, two cities that will house many of the construction workforce, many outdoor recreational opportunities and recreational facilities exist. These recreational opportunities in Casper and Douglas are approximately 20-30 miles from the study area.

Table 6-14 Recreational Opportunities within 10 miles of Pioneer Wind Park Projects.

Location	Facility Name	Description
Glenrock	Al's Way (Walking Path)	Walking Path
Glenrock	Glenrock Town Park	Picnic; baseball fields; tennis courts; skate park; provides access to Al's Way
Glenrock	Kimball Park	Picnic area
Glenrock	McLagan Tot Lot	Picnic area, playground
Glenrock	Rookstool Park	Playground
Glenrock	Rock in the Glen	Served as Deer Creek crossing during the pioneer days, undeveloped parkland
Glenrock	South Recreation Complex	Rodeo arena, softball fields, paintball, playground
Glenrock	Oregon Trail Park	Historic wagon ruts, original vegetation, playground
Glenrock	Glenrock Golf Course	Golf Course
Glenrock	Glenrock Community Recreation Center	The Glenrock Rec Center is operated by the Glenrock Recreation District and is a free service for the community. The Center offers physical fitness classes, a game room, a weight room, cardiovascular equipment, a gym and a swimming pool located at the Glenrock Middle School.
Glenrock	Westglen Park	Undeveloped parkland
Rolling Hills	Local Open Space	Undeveloped parkland
Rolling Hills	Town Park	Picnic area, playground, basketball court,
Converse County (privately owned lands with public access)	Dave Johnston Recreation Area	Hunting, fishing
Converse County	Converse County Park	Hiking
Converse County - East of Study Area Boundary	Box Elder Park - County Park	Scenic views
Converse County - East of Study Area Boundary	Ayres Natural Bridge - County Park	Hiking, picnic, scenic
Converse County and Carbon, Albany and Platte Counties	Medicine Bow National Forest	Hiking, sightseeing, camping, climbing, bicycling, hunting, fishing, picnic areas
Converse County	Box Elder Mormon Canyon Road scenic loop	Scenic drive
Converse County	Deer Creek and Duncan Ranch Hunter Management Areas (Appendix F, Maps 13 & 14)	Hunting on private and state lands

Sources: Town of Glenrock; Converse County Tourism Promotion Board; Rolling Hills Future Land Use Map; Converse County.org; Wyoming Game and Fish Department.

6.13.3.1 Douglas

Douglas offers 12 parks totaling 138 acres with a variety of amenities such as playgrounds, ballfields and tennis courts as well as several miles of hiking and biking trails and a municipal water park, which opened in the summer (Douglas 2010). Converse County School District # 1 operates the Douglas Recreation Center. There is also a golf course in Douglas.

Douglas also serves as the entry point to several state parks and historic areas including Fort Fetterman, which is administered by the Wyoming Division of State Parks and Historic Site; Esterbrook, popular for hunting, fishing, snowmobiling, skiing and camping; Glendo State Park and Glendo Lake with 12,500 acres of land and clear waters for boaters, fishermen, skiers and swimmers, including a full use marina and miles of sandy beach; and Laramie Peak, located in the vast Medicine Bow National Forest (MBNF) in southern Converse County, which has been home to explorers since the 1800s. A map of recreation areas in the city of Douglas is included as Map F-11 in Appendix F.

6.13.3.2 Casper

Casper offers 44 parks including 261 acres of formal turf, with over 100 acres of athletic fields and 2.5 acres of playgrounds. There are also approximately 1,000 acres of undeveloped parkland (Casper 2010). The Platte River Parkway offers hiking, bicycling and picnicking opportunities and the Casper Recreation Center offers recreation and fitness facilities and a full range of health and fitness, arts and crafts and recreation classes. Casper also offers four golf courses, an aquatic center, a recreation center and ice skating and alpine skiing and snowboarding facilities at the Hogadon Ski Area on Casper Mountain.

6.13.3.3 Historic Trails

Four historic trails pass through Converse County offering outdoor recreation of historic significance: the Oregon, California, Mormon Pioneer and Pony Express Trails.

6.13.4 Construction Impacts

The impact of construction activities and work force on community and urban outdoor recreation resources within the area of site influence would include the use of community parks and recreation

facilities by construction workers, the effects of construction activities on outdoor recreation resources and access routes and the change in the outdoor recreation setting.

The relatively small and short-term construction workforce would likely have little effect on community parks and recreation facilities. The distribution of the non-local workforce at peak (23 persons in Glenrock, 6 in Douglas and 99 in the Casper area) would be a fraction of the current and anticipated regional population. Consequently, its effects on park and recreation center use by construction workers would be negligible. Similarly, the use by construction workers of the extensive outdoor recreation resources available within the region would have negligible effects on those resources.

Construction activities on the PWP I and PWP II sites may affect recreation travelers on the Mormon Canyon Road for the six-month duration of each of the two construction segments as recreation travelers may encounter temporary delays, construction activities and equipment. The Box Elder Road, which would not be affected by PWP I or PWP II construction, aside from possibly along the short segment connecting Windy Ridge Road to the southern end of Mormon Canyon Road, provides an alternate route to the MBNF. Appropriate signage alerting recreation visitors to the MBNF of construction activities and the availability of the Box Elder Road route could avoid some of the potential effects of construction on the Mormon Canyon Road. Construction activities would not affect recreation use of Box Elder Park, but use of the Mormon Canyon - Box Elder Road loop tour would likely be affected during construction.

Pursuant to our leases, private property owners retain the ability to manage any non-wind related activities on their property, including allowing hunting and recreation. The proposed site plan includes for PWP I includes four turbines which are located in the northern tip of the Deer Creek Hunter Management Area (see Map F-11). This may affect hunting during construction. This affected portion of the Deer Creek HMA represents 0.04 percent of the total HMA (approximately 26 acres during construction of the total 67,532 acres). Hunting should be able to continue unimpeded in the remainder of the HMA during construction. After construction hunting activities would resume uninterrupted assuming that the landowners continue to participate in the HMA program.

Hunting may also be affected on private and state lands in the PWP I and PWP II project sites during the two construction seasons.

During the construction periods, recreational uses of the area may be altered. For recreation users, any change may occur in the private and state lands along Mormon Canyon Road in and near the project sites as WTGs are constructed (see Section 6-11 Scenic Resources).

6.13.5 Operations Impacts

PWP I, LLC and PWP II, LLC O&M staff of six people would have little effect on community parks and recreation centers. Once PWP I and PWP II become operational, their affect on outdoor recreation would be limited to the change in viewshed from some recreation sites. Except during brief periods of major WTG maintenance activities, hunting and other recreational uses of the project area would continue at the discretion of the landowner. Recreationists traveling through the project area on Mormon Canyon Road, whether on the loop tour or en route to the MBNF, would view the WTGs and ancillary facilities. The effects of this change would depend in large part on the visitor's attitudes and opinions about wind energy. The location of the Projects offers an opportunity for an interpretive kiosk, which would provide information about the Projects and wind energy in general. For some recreational visitors, the addition of an interpretive kiosk could enhance the recreation experience.

6.14 LAND USE

This section presents information regarding existing and future land uses, zoning, and adopted land use plans and regulations applicable to the PWP I and PWP II.

6.14.1 Regulatory Jurisdiction

Converse County has regulatory jurisdiction over land use in the study area through the County Land Use Plan, Planning and Zoning Board, and Board of Commissioners. The County has jurisdiction over wind energy projects in particular through its recently adopted Wind Energy Siting Regulations. The State of Wyoming OSLI has jurisdictional authority over the state land parcels in the project area. Under W.S. 35-12-109, the ISC requires evaluating potential project-related impacts to land use patterns and assessing the compatibility of the facility with state or local land use plans resulting from project implementation.

6.14.2 Consistency with Land Use Plans

The area of site influence for land use consists of the two Project sites and the County Roads that will be used to access the site. These areas are located entirely within Converse County. The proposed development site for PWP I comprises approximately 4,354 acres and the PWP II site comprises approximately 7,510 acres. These acreages include both private fee lands and state trust lands. No federal lands will be used for any project-related infrastructure.

6.14.2.1 Converse County Land Use Plan

According to the General Land Use Map for Converse County contained in the Converse County Land Use Plan (Converse County 2003), the study area and surrounding private fee lands are categorized as Agricultural. This designation describes "lands, which because of the resource value, e.g. agriculture, non-traditional agriculture use, recreation, and extraction, are encouraged to remain undeveloped. As discussed in Section 5.4, the Projects will not alter the current land use category.

The newly adopted Converse County Wind Energy Siting Regulations require all facilities with gross generation of 0.5 MW or greater to apply for a Wind Energy Conversion System (WECS) Use Permit. The application process involves the Planning and Zoning Board and the Board of County Commissioners, as well as community input during a defined and requisite public comment period and hearing.

The WECS permit applicants must certify that the proposed facility will comply with all applicable state and county zoning and land use regulations. The applicant must also submit with the application a waste management plan and a reclamation/decommissioning plan to ensure future compliance with the land use designation.

6.14.2.2 State of Wyoming Land - Special Use Leases

WWI intends on pursuing a wind energy lease application through the Office of State Lands and Investments (OSLI) for 2,504 acres of State of Wyoming Trust Lands. If approved, this lease would allow for the placement of WTGs on State Trust Lands in PWP II. The State Lands included in the lease application are surrounded by or abutting private lands already under lease by PWPLLC, PWP I, LLC or PWP II, LLC. The State Land parcels included in our application are currently being leased for grazing

by adjacent private landowners who have signed lease agreements with PWPLLC, PWP I, LLC or PWP II, LLC and are supportive of wind power development on these lands. WWI intends to seek approval of its pending wind energy lease application before the State Board of Land Commissioners at an upcoming Board Meeting.

6.14.3 Construction Impacts

Existing access roads will be used or improved where practicable to minimize PWP I and PWP II impact to lands within the project area. The Projects will be designed with all turbines located in compliance with W.S. 18-5-504, which defines minimum setbacks from property lines, public roads, city limits, and private residences. This will ensure the PWP I and PWP II does not impact activities on lands adjacent to the project areas. Lands within the two project sites are primarily used for grazing. Although construction of the Projects may conflict somewhat with grazing during the construction periods, this disturbance associated with construction activity would be temporary, limited to one summer and one fall season per site and will be coordinated with the private landowners (our lessors). In the first few years following construction, reclaimed temporary use areas will begin to produce forage and effects on grazing will be negligible. Development of the Projects will be consistent with all relevant land use plans, policies, and regulations.

6.14.4 Operation Impacts

The operation of wind turbines is highly compatible with grazing and farming activities. Cattle, sheep, and other domestic animals routinely graze underneath operating wind turbines at projects across the United States and around the world, and ranchers regularly farm around wind turbines. Operation of a wind energy facility is compatible with existing and future surrounding land uses in the project area.

6.15 TRANSPORTATION

This section identifies the primary and secondary transportation routes by which construction and operations personnel and heavy equipment are expected to access the two project sites. This analysis was prepared by Civil Engineering Professional, Inc. (CEPI) out of Casper under contract to WWI.

6.15.1 Transportation Facilities/Routes

The expected travel routes for construction materials, personnel and all other transport vehicles associated with construction and operation of the proposed Projects are described below. At this time, it is not expected that a substantial volume of rail traffic will be generated by the Projects. Construction materials will primarily be trucked in via I-25.

6.15.1.1 Key Transport Route Roadways

Various Federal, State and County roadways are likely to be impacted by traffic generated by this project. The following paragraphs identify the roadways that are most likely to be impacted by site-generated traffic. Map 1 in Appendix A illustrates the layout of the two Projects with key transportation features noted.

Interstate 25 (I-25)

Interstate 25 extends south from northern Wyoming through Colorado and into New Mexico. Adjacent to the project site, I-25 is a four-lane divided freeway that extends east from Casper past Glenrock and through Douglas before eventually turning south. There are several I-25 interchanges in the general area between Casper and Douglas. However, three particular interchanges are relevant to the access routes that may be used for this project. The Deer Creek Interchange is located at milepost 165.82 southwest of Glenrock. The interchange provides access to Deer Creek Road (County Road 19), which extends south into a rural area and north into Glenrock (as 4th Street). The East Glenrock Interchange is located at milepost 160.78 southeast of Glenrock. It provides access to Birch Street (US 20/26), which extends northwest into Glenrock. The La Prele Interchange is located at milepost 145.90, approximately four miles northwest of Douglas. The La Prele Interchange provides access to Cherokee Trail (County Road 30), which extends north into a rural area and provides connectivity north and south of the interchange with various other local State and County routes.

Mormon Canyon Road

Mormon Canyon Road (County Road 18) extends south from Birch Street in Glenrock as a winding and narrow two-lane highway. Approximately two miles south of Birch Street, Mormon Canyon Road

underpasses I-25 and the paved surface turns to gravel. The underpass has a signed clearance of 16'11". Also at this point, a sign along the roadway informs drivers that the unpaved portion of Mormon Canyon is not maintained from the beginning of November through the end of April. South of I-25, Mormon Canyon Road winds up and across the foothills and eventually into the Medicine Bow National Forest after passing through the area of study. Through this area the roadway is narrow, winding and steep at times with dense foliage and/or rock cliffs along one or both shoulders. There are no existing bridges on Mormon Canyon Road, but there are several culverts where the road crosses drainage areas and multiple cattle guards. The roadway width generally varies from 16 feet at the southern end to 24 feet at the intersection with Birch Street. More discussion of the general condition of the roadway is contained in a later section of the report. The measured distance along Mormon Canyon Road from Birch Street to Box Elder Road was 18.0 miles. The Mormon Canyon Road-Box Elder Road intersection is considered to be the common point southern boundary of the project area for the purposes of this study.

Birch Street

Birch Street (WY 20/26) extends northwest from the East Glenrock Interchange through Glenrock and on to Casper as the Old Glenrock (State) Highway. Approximately 3.2 miles northwest of the interchange, Birch Street intersects with Mormon Canyon Road. Within Glenrock, Birch Street is a primary east-west oriented through-travel and local business street. It is paved throughout and generally consists of a two-lane rural highway, though a segment of the street through the Glenrock business district is four lanes with curb and gutter. The two-lane highway section is approximately 34 feet wide, with 12-foot travel lanes and 5-foot shoulders.

Sunflower Trail

Sunflower Trail (WY 96) is a two-lane paved rural highway that extends west and southeast from the La Prele Interchange providing access to various rural areas between Glenrock and Douglas. Approximately 3.5 miles southeast of the interchange, Sunflower Trail becomes Cold Springs Road and extends eastward into Douglas. Cold Springs Road also extends south from that intersection. Sunflower Trail has a paved surface width of approximately 24 feet.

Cold Springs Road

Cold Springs Road (WY 91) is a two-lane paved State highway that extends west from the outskirts of Douglas before turning south at its intersection with Sunflower Trail. South of Sunflower Trail, Cold Springs has is a winding and hilly highway with a narrow paved surface. However, it does not have the same severe grade and alignment concerns as Mormon Canyon Road or Box Elder Road, because it passes through a valley that has been cut in the rising terrain. Approximately 17.1 miles southwest of the La Prele Interchange, Cold Springs Road intersects with Windy Ridge Road, which extends west into the project site area. There are no existing bridges along Cold Springs Road between Sunflower Trail and Windy Ridge Road. However, there is a Pinnacle Materials quarry located along Cold Springs Road (approximately 7.8 miles south of the La Prele Interchange along the travel route) that was generating a substantial volume of truck traffic to and from the Douglas area during the site observation period for this study. Cold Springs Road has a paved surface width of approximately 22 feet. WYDOT is planning a construction project to overlay approximately eight miles of Cold Springs Road from Sunflower Trail south. This project is expected to be constructed in 2011.

Windy Ridge Road

Windy Ridge Road (County Road 14) is an unpaved County road that connects Cold Springs Road and Box Elder Road. The road varies in width from approximately 17 feet to 22 feet. There is a small elementary school located approximately ¼ mile west of Cold Springs Road on Windy Ridge Road. Immediately west of the school, the road crosses La Prele Creek. The bridge over the creek is narrowed and degraded. There are several sharp horizontal curves along Windy Ridge Road and a couple of additional drainage crossings. There is also a section of the road that consists of a long and steep grade with poor roadside drainage, which has resulted in some erosion along the edges of the roadway.

Box Elder Road

Though it is not currently being considered as a project access road, a description of Box Elder Road (WY 90/County Road 17) is included for completeness. Box Elder Road extends south from Birch Street as a paved two-lane State highway. Approximately 0.8 miles south of Birch Street, Box Elder Road underpasses I-25. The underpass has a signed clearance of 16’4”. The road continues as a (paved) State highway for an additional 2.2 miles before becoming a County road. Approximately 8.3 miles south of Birch Street, the roadway surface changes from paved to gravel. Like Mormon Canyon Road, Box Elder

Road passes into the foothills as it approaches the project area. Steep grades and a narrow, winding alignment are common through this stretch. There is a narrow bridge that crosses Box Elder Creek just south of the pass. Just as with Mormon Canyon Road, there are multiple cattle guard structures along Box Elder Road. Box Elder Road intersects with Windy Ridge Road approximately 13.0 miles south of Birch Street. The total distance along Box Elder Road from Birch Street to Mormon Canyon Road is approximately 16.7 miles. The roadway width generally varies from 18 feet to 28 feet in the unpaved sections. The paved section is typically 21 to 24 feet wide.

6.15.1.2 Key Transport Route Intersections

Several intersections will also be affected as a result of the proposed Projects. The following paragraphs discuss location, geometrics, traffic control and other key features of each intersection. Map 1 in Appendix A illustrates the intersection locations relative to the project area.

Birch Street-Mormon Canyon Road

The intersection of Birch Street and Mormon Canyon Road is a “T” intersection that is located immediately east of the Deer Creek Bridge within the town limits of Glenrock. Less than 100 feet to the east, Millar Lane extends north from Birch Street at another “T” intersection. Due to the close proximity and offset of these intersections, and since there are no auxiliary left-turn lanes in either case, westbound left-turns on to Mormon Canyon Road may conflict with eastbound left turns on to Millar Lane. The intersection of Birch Street and Mormon Canyon Road is presumably intended to be two-way stop controlled, although there was not a stop sign posted on the Mormon Canyon Road approach at the time of traffic observations. Intersection sight distance from the minor approach is adequate in both directions for a typical passenger vehicle or moderate-sized truck.

I-25 Westbound Off-Ramp-Birch Street (East Glenrock Interchange)

The intersection of the I-25 westbound off-ramp at the East Glenrock Interchange and Birch Street has an unusual configuration. The off-ramp serves as the major street for this intersection and actually consists of two lanes, one of which becomes an auxiliary right-turn bay at a downstream County road intersection. The other travel lane becomes the northwestbound primary lane on Birch Street. The resulting intersection configuration is a two-way stop-controlled “T” intersection with two one-way lanes serving as the major street at the intersection. Intersection sight distance is very good at this location.

I-25 Westbound On-Ramp-Birch Street (East Glenrock Interchange)

The remaining ramps at the East Glenrock Interchange (other than the westbound off-ramp) operate as a traditional diamond configuration. The intersection for the westbound on-ramp does not have a minor approach, since the westbound off-ramp is essentially a slip lane onto Birch Street. As a result, this intersection is uncontrolled. The only vehicle conflicts are between northbound left-turns and southbound right-turns accessing the on-ramp. There are no existing sight distance concerns at this intersection.

I-25 Eastbound Ramps-Birch Street (East Glenrock Interchange)

This intersection is a traditional two-way stop controlled diamond interchange ramp intersection, with no southbound approach (there is a parking area south of the intersection). The intersection is spaced very closely to the underpass structure. There are no sight distance issues at this intersection.

I-25 Westbound-Cherokee Trail (La Prele Interchange)

The La Prele interchange is a traditional diamond interchange with very little offset between the ramp intersections and the adjacent frontage road intersections. This intersection is two-way stop controlled. There are no sight distance concerns at the intersection. Both ramps have cattle guard structures.

I-25 Eastbound-Cherokee Trail (La Prele Interchange)

Similar to the westbound ramps intersection, this intersection is two-way stop controlled. There are no sight distance concerns. Both ramps have cattle guard structures.

Sunflower Trail-Cherokee Trail

This intersection is a two-way stop controlled “T” intersection that is offset only 100 feet from the adjacent La Prele Interchange eastbound ramps intersection. West of the intersection, Sunflower Trail becomes a gravel road after crossing a cattle guard.

Sunflower Trail-Cold Springs Road

The Sunflower Trail-Cold Springs Road intersection is also a two-way stop controlled "T" intersection. The northbound minor approach has a right-turn slip lane that is yield-controlled. Sight distance is adequate to the east and west.

Cold Springs Road-Windy Ridge Road

The intersection of Cold Springs Road and Windy Ridge Road is two-way stop controlled with a stop sign posted on the Windy Ridge Road minor approach. Windy Ridge Road is a gravel road and there is a cattle guard just west of the intersection. Sight distance is somewhat limited to the north and excellent to the south.

6.15.1.3 Project Transport Route Alternatives

Two possible routes from I-25 to the project site have been selected for materials and personnel transport. The primary route will utilize Mormon Canyon Road, which extends south from Birch Street in Glenrock to the project site. A secondary route option utilizing Sunflower Trail, Cold Springs Road, Windy Ridge Road, and Box Elder Road may be also utilized, but only under special circumstances. All traffic, including transport, construction, and commuter vehicles will be directed to utilize the Mormon Canyon Road route except in the case of an emergency or if otherwise directed. The following paragraphs discuss the access routes in depth and list potential problems relative to the expected design vehicles and traffic loads for this project. For the purposes of this report, the Box Elder Road-Mormon Canyon Road intersection (south end of the project area) was considered as a common origin/destination point. Map 1 in Appendix A illustrates the transport routes relative to the overall project area.

Mormon Canyon Road Route

The Mormon Canyon Road Route will require oversized transport vehicles to enter or exit I-25 at the East Glenrock Interchange. Although the Deer Creek Interchange would be more convenient for traffic from the west, use of that route would require vehicles to travel directly through the Town of Glenrock in order to reach Mormon Canyon Road. Personnel commuting from the Casper area would likely utilize the Deer Creek Interchange to access Mormon Canyon Road rather than backtracking from the East Glenrock Interchange. The East Glenrock Interchange will be used by materials and personnel transported from the

east. From the interchange, Project traffic would utilize Birch Street and Mormon Canyon Road to access the project sites. Via this route, transport vehicles would only have to navigate one intersection (Birch Street-Mormon Canyon Road) beyond the interchange in order to reach the project area. From the Deer Creek Interchange, Project traffic would utilize Deer Creek Road (4th Street), Birch Street, and Mormon Canyon Road to access the site. The intersection of Birch Street and Mormon Canyon Road may need to be modified in order to accommodate oversized transport vehicles. As indicated above, any modifications to this intersection may also impact the Millar Lane intersection, due to the close proximity and conflict between left-turn movements. The total distance from the Birch Street-Mormon Canyon Road intersection to the Box Elder Road-Mormon Canyon Road intersection along the Mormon Canyon Road route is approximately 18.0 miles. The final 16.0 miles along Mormon Canyon Road are unpaved. Signs at the ends of the unpaved portions of Mormon Canyon Road state that the road is not maintained from early November to late April.

The Mormon Canyon Road route would require traffic to ascend approximately 1,000 vertical feet in 3.5 miles along a narrow, winding road. Some modification of the roadway would be necessary in order for turbine component transport vehicles to utilize this route. A portion of the roadway is cut into the side of a mountain, with vertical rock faces above and below the road. The roadway surface is narrow and poorly graded, especially toward the south end of Mormon Canyon Road. Although there are no bridges along this route, the road does cross several drainages, so it may be necessary to lengthen culverts if the road is widened. There are no known businesses, schools or other such entities along this route that would be substantially impacted by construction or operations traffic.

Cold Springs Road Route

The Cold Springs Road (alternative) Route would generally require vehicles to enter or exit I-25 at the La Prele Interchange northwest of Douglas. The clearance for the underpass at the interchange is signed at only 12’11”, so some transport vehicles would not be able to access the Cold Springs Road Route via this interchange coming from the east on I-25. As an additional challenge at the La Prele interchange, the ramp intersections have narrow approaches, small radii, and are very closely spaced relative to the adjacent frontage road intersections and the underpass structure. Alterations to the horizontal geometry of this interchange would likely be necessary in order for all of the oversized transport vehicles to be accommodated.

From the La Prele interchange, traffic would utilize Cherokee Trail, Sunflower Trail, Cold Springs Road, Windy Ridge Road and Box Elder Road to reach the project sites. Each of the intersections along this route would likely require modification in order to accommodate the large turning radii for the proposed transport vehicles. The total distance from the La Prele Interchange to the Box Elder Road-Mormon Canyon Road intersection is approximately 26.7 miles, with the final 9.6 miles consisting of gravel roads.

Numerous horizontal and vertical curves along this route could be problematic for some of the transport vehicles. The roads are generally narrow and there is one section of Windy Ridge Road that has a lengthy and steep grade. The pavement on Sunflower Trail and Cold Springs Road is rough and in poor condition in various places, though it should again be noted that WYDOT is planning to overlay eight miles of Cold Springs Road immediately south of Sunflower Trail next year. The gravel surfaces on Windy Ridge Road and Box Elder Road are generally in fair condition, though some rutting and washboarding are evident. There are several cattle guards along the route and one narrow bridge will need to be reconstructed. The bypass route includes two very narrow cattle guards and a concrete bridge/spillway structure over the creek. In addition to the bridge, there are other drainage areas along the route that may require widening of culverts if the roadway is widened.

As an additional consideration for this route, there is a Pinnacle Materials, Inc. quarry located along Cold Springs Road that was generating consistent heavy truck (tractor-trailer) traffic to and from the Douglas area at the time of traffic data collection. If this operation is ongoing during construction of the Pioneer Wind Park, it will be necessary to carefully coordinate transport vehicle travel through this corridor. There is also an elementary school located along the south side of Windy Ridge Road, immediately east of Cold Springs Road, which will require coordination of traffic with school hours and construction vehicles.

6.15.2 Existing Conditions

6.15.2.1 Traffic Volumes

Prior to evaluating changes in traffic associated with Project implementation, it was necessary to observe current traffic conditions and establish a baseline for traffic demand at key locations in the study area. As such, peak hour (AM and PM) turning movement counts were performed at the following key study area intersections in October and November of 2010:

- Deer Creek Road/I-25 Deer Creek Interchange ramps
- Birch Street/4th Street
- Birch Street/Mormon Canyon Road
- Birch Street/I-25 East Glenrock Interchange ramps
- Cherokee Trail/I-25 La Prele Interchange ramps
- Cherokee Trail/Sunflower Trail
- Sunflower Trail/Cold Springs Road

The AM peak period counts were conducted from 7:00-8:00 AM and the PM peak period counts were conducted from 4:30-5:30 PM. Raw count data was not adjusted for seasonal or daily variation. Entering volumes for each intersection approach are shown in Table 6-15, below. None of the study area intersections currently experience a particularly high traffic demand. The East Glenrock and La Prele interchange intersections had very low peak hour traffic demands when observed for the purposes of this study.

Table 6-15 Existing Conditions Average Daily Traffic Volumes.

Location	Average Daily Traffic (Vehicles/Day)	Heavy Vehicles (%)
Interstate 25 - Deer Creek Interchange	3,960 [1]	20%
Interstate 25 - East Glenrock Interchange	4,030 [1]	20%
Interstate 25 - La Prele Interchange	4,100 [1]	20%
Deer Creek Road - South of Birch Street	2,216 [2]	2% [2]
Mormon Canyon Road - South of Birch Street	485	3%
Birch Street - Northwest of Box Elder Road	1,666	7%
Sunflower Trail - Southeast of La Prele Interchange	251	7%
Cold Springs Road - South of Sunflower Trail	355	22%
Cold Springs Road - West of Pinnacle Materials	227	n/a

[1] Data from WYDOT 2008 Vehicle Miles Book increased by 1% annual growth to approximate 2010 volumes.
[2] Estimated based on AM and PM peak hour counts and measured area hourly traffic distribution.

Average daily traffic (ADT) count data was also obtained from WYDOT for several locations along I-25. Additional ADT and vehicle classification counts were performed for a minimum of 48 hours in October of 2010 at the following locations:

- Mormon Canyon Road - south of Birch Street
- Box Elder Road - south of Birch Street
- Birch Street - northwest of Box Elder Road
- Sunflower Trail - southeast of the La Prele interchange
- Cold Springs Road - south of Sunflower Trail
- Cold Springs Road - west of Pinnacle Materials quarry

Raw traffic count data was not adjusted for any seasonal or day-of-week variation. Table 1 below presents the results of the ADT counts, as well as the traffic volume data provided by WYDOT. The ADT figure for Deer Creek Road was projected based on AM and PM peak hour turning movement volumes and observed area hourly traffic demand variations.

6.15.2.2 Intersection Capacity

The measure of how efficiently an intersection handles traffic is typically referred to as intersection capacity. Intersection capacity is most often described through a concept known as level of service (LOS). The Highway Capacity Manual defines LOS as a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions and comfort and convenience. LOS is evaluated using letter designations from A to F, with A being the most favorable operating condition and F being the worst. Level of service C is generally considered to be the minimum threshold for acceptable peak hour (generally the morning and evening rush hours) traffic operations.

For this study, existing conditions intersection capacity was evaluated for the AM and PM peak periods at ten key study area intersections. All of the intersection approaches were found to operate at an LOS of B or better during both peak periods, which is an indication of smooth and efficient traffic operations. No significant queues were projected through the capacity calculations. These results are not unexpected given the low level of existing traffic demand for the analyzed intersections. Detailed capacity calculation results for are shown in Table 6-16 on the following page.

Table 6-16 Existing Conditions Intersection Capacity Calculation Results.

		Existing Conditions (2010)							
		AM Peak				PM Peak			
Intersection	Approach	Approach Volume (vehs)	Control Delay (s/veh)	LOS	Max Queue (veh)	Approach Volume (vehs)	Control Delay (s/veh)	LOS	Max Quesue (veh)
Intersection Control					**Two-way Stop**				
Deer Creek Road and I-25 EB ramps	NB	6				7			
	SB	6	7.2	A	1	10	7.2	A	1
	EB	22	8.7	A	1	67	8.9	A	1
	Intersection	34	--	--	--	84	--	--	--
Intersection Control					**Two-way Stop**				
Deer Creek Road and I-25 WB ramps	NB	28	7.4	A	1	70	7.3	A	1
	SB	84				36			
	WB	3	8.7	A	1	3	8.9	A	1
	Intersection	115	--	--	--	109	--	--	--
Intersection Control					**Two-way Stop**				
Birch Street and 4th Street	NB	95	8.6	A	3	116	8.5	A	3
	SB	90	9.0	A	3	79	8.6	A	3
	EB	90	8.5	A	2	137	8.4	A	2
	WB	126	8.9	A	2	145	8.7	A	2
	Intersection	401	8.8	A	--	477	8.6	A	--
Intersection Control					**Two-way Stop**				
Birch Street and Mormon Canyon Road	NB	4	11.0	B	1	12	12.1	B	1
	EB	254				278			
	WB	220	7.8	A	1	204	7.9	A	1
	Intersection	478	--	--	--	494	--	--	--
Intersection Control					**Two-way Stop**				
Birch Street and I-25 WB on-ramp	NB	12	7.3	A	1	14	7.3	A	1
	SB	42				69			
	Intersection	54	--	--	--	83	--	--	--
Intersection Control					**Two-way Stop**				
Birch Street and I-25 WB off-ramp	NB	12	8.6	A	1	13			
	WB	20	7.2	A	1	43			
	Intersection	32	--	--	--	56	--	--	--
Intersection Control					**Two-way Stop**				
Birch Street and I-25 EB ramps	SB	35	7.3	A	1	35	7.3	A	1
	EB	12	9.0	A	1	13	9.0	A	1
	Intersection	47	--	--	--	48	--	--	--
Intersection Control					**Two-way Stop**				
Cherokee Trail and I-25 WB ramps	NB	14	7.2	A	1	12	7.2	A	1
	SB	16				8			
	WB	3	8.7	A	1	8	8.4	A	1
	Intersection	33	--	--	--	28	--	--	--
Intersection Control					**Two-way Stop**				
Cherokee Trail and I-25 EB ramps	NB	16				12			
	SB	12	7.2	A	1	8	7.2	A	1
	EB	8	8.3	A	1	6	8.3	A	1
	Intersection	36	--	--	--	26	--	--	--
Intersection Control					**Two-way Stop**				
Sunflower Trail and Cherokee Trail	SB	13	8.6	A	1	6	8.6	A	1
	EB	1	7.2	A	1	1	7.2	A	1
	WB	16				11			
	Intersection	30	--	--	--	18			

6.15.2.3 Highway Capacity

The Highway Capacity Manual also provides guidance on the evaluation of capacity and level of service for highways and freeways. Critical factors include terrain, availability of passing zones, speed limits, heavy vehicle percentages and of course, overall traffic demand volume. Once again, LOS is evaluated using letter designations from A to F, with A being the most favorable operating condition and F being the worst. LOS C is generally considered to be the minimum threshold for acceptable peak hour (generally the morning and evening rush hours) traffic operations.

For this study, Birch Street, Sunflower Trail, Cold Springs Road, Deer Creek Road and the paved segment of Mormon Canyon Road were evaluated in terms of highway capacity. I-25 was evaluated relative to freeway capacity. Base free flow speeds were approximated based on the posted speed limits for each roadway. Availability of passing zones was estimated based on site observations. Design hour volumes were calculated from turning movement counts where possible and estimated based on a factor of ADT where peak period turning movement volumes were unavailable. Calculation results showed that all segments of the study area highways currently operate at an LOS B or better during the peak traffic periods. I-25 was shown to operate at LOS A in both directions. Table 6-17 below illustrates the results of the calculations.

Table 6.17 Existing Conditions Highway/Freeway Capacity.

Location	Design Hour Volume (veh/hour) - AM/PM	LOS
Deer Creek Road - North of I-25	182/221	B/B
Mormon Canyon Road - South of Birch Street	13/94	A/B
Birch Street - East of Mormon Canyon Road	469/422	B/B
Sunflower Trail - Southeast of La Prele Interchange	29/17	A/A
Cold Springs Road - South of Sunflower Trail	36/36 [1]	A/A
Cold Springs Road - West of Pinnacle Materials	23/23 [1]	A/A
Interstate 25 - Deer Creek Interchange (EB or WB)	301/301 [1]	A/A
Interstate 25 - East Glenrock Interchange (EB or WB)	306/306 [1]	A/A
Interstate 25 - La Prele Interchange (EB or WB)	310/310 [1]	A/A

[1] Design hour volumes estimated based on ADT volumes.

6.15.3 Construction Impacts

6.15.3.1 Projected Traffic Generation

Component Transport and Construction Traffic

As described in Chapter 2 of this Application, 31 WTGs will be constructed in each of the two project sites. Based on information from the component supplier, each WTG installation will generate approximately 60-65 concrete and other materials truck trips, approximately 20 truck trips with crane components, as many as 2 assist cranes, 7-8 heavy haul trucks with turbine components, and 2-5 extended reach forklifts for a maximum total of approximately 100 materials and component trucks per WTG. Although each of the above vehicles and components will initially need to be delivered to the project sites, the majority of impacting traffic will actually be generated once construction and assembly are initiated at the sites. At a maximum, these Projects would generate approximately 12,400 one-way trips by turbine component and construction materials transport vehicles only. An additional 1,100 truck loads per project (2,200 total) are anticipated for roadway reconstruction. In total, 14,600 construction-related one-way truck trips are projected for the two Projects.

Construction activity is expected to peak in August of 2011 during construction of PWP I. It is estimated that 30% of overall construction traffic will occur during this month, resulting in a typically daily demand of 110 one-way truck trips per peak period work day. It is anticipated that all of the raw construction materials (aggregate, concrete, etc.) necessary for roadway base and site improvements will be produced at the Project sites and thus will not have to be trucked in from I-25. Therefore, it is not expected that any of those 110 daily truck trips would directly impact the streets and highways evaluated in this study.

In addition to the construction truck traffic described above, various ancillary trips related to fuel, mechanics, vendors and maintenance items are also expected. These trips are likely to originate in the Casper, Glenrock, and/or Douglas areas. As such, they would impact traffic operations for streets and intersections evaluated in this analysis. For the purposes of this study, it was estimated that a maximum of approximately 20 one-way trips/day could be expected to account for this maintenance-based traffic.

Commuter Traffic

Based on the socioeconomic analysis conducted for this Application (Chapter 5), it is expected that approximately 70% of the construction work force will be workers brought in from other areas, and 30% will comprise locals already living in the immediate area. Once the Projects are operational, approximately 50% of the O&M staff will be local to the area. Of the non-local workforce, it is expected that approximately 75% will live in the Casper area, 18% will live in the Glenrock area, 5% will live in the Douglas area and the remaining employees will reside in other surrounding locales. For local-based employees, it is estimated that approximately 60% will be from the Casper area, 20% from the Glenrock area, 15% from the Douglas area and 5% from other local communities.

Construction for PWP I is scheduled to begin in June of 2011 and conclude in December of 2011. Construction of PWP II is scheduled to begin in July of 2012 and conclude December of 2012. The overall monthly workforce during construction of PWP I is expected to vary between approximately 48 and 168 employees. For PWP II, the monthly workforce would vary from 48 to 145 employees. During the peak month of construction for PWP I, it is estimated that 168 employees will be commuting to and from the project site. Assuming a carpool rate of 1.5 persons/vehicle and only one trip in and one trip out per commuter vehicle, this would result in a commuter traffic generation of 224 one-way trips per day (112 in/112 out). For the purposes of this study, it was assumed that 90% of employees would work a typical day shift and that 10% would work a night shift.

Table 6-18, below, provides a summary of projected total project (PWP I and PWP II) and peak daily site-generated traffic. Commuter traffic is expected to account for nearly 2/3 of the daily project-generated trips.

Table 6-18 Traffic Generation Projections.

Trip Category	Total Projected Trips (one-way trips - both projects)	Peak daily Demand (one-way trips/day)
Turbine Component Delivery/assembly	4,340	28
Turbine Construction Materials Trucks	8,060	53
Roadway Construction Trucks	2,200	29
Miscellaneous Construction Traffic	5,160	20
Commuter Traffic	27,140	224

6.15.3.2 Trip Routing

For component delivery purposes, WWI has indicated that the majority of component transport vehicles will likely originate from areas south of the project site and that they would primarily use I-25 to access the project area. It's also possible that some traffic could be re-routed via Interstate 80 (I-80)/US 287/WY 487/WY 220 route through Casper and end up approaching the project area from the west, eastbound on I-25. Based on information from the developer, it is not anticipated that any of the roadways associated with the I-80 route would require improvement or modification in order to safely and efficiently accommodate traffic generated by the projects. The primary route from I-25 will be the Mormon Canyon Road route, regardless of an eastbound or westbound approach to the Glenrock area. For heavy vehicles, it will be necessary to utilize the East Glenrock interchange to avoid driving through Glenrock.

In terms of everyday Project-generated traffic, all commuter and ancillary support vehicular trips will be routed to the project site via Mormon Canyon Road, except in special cases. Traffic from the west on I-25 will likely exit at the Deer Creek Interchange, while traffic from the east will most likely utilize the East Glenrock Interchange.

6.15.3.3 Traffic Impacts

PWP I and PWP II will generate a substantial amount of traffic during their respective construction periods. The traffic loadings will consist of construction materials and component transport vehicles, as well as commuter transport vehicles and ancillary support service vehicles. Several access routes are available from I-25 to the project area. However, PWP I, LLC and PWP II, LLC will require that all traffic utilize the Mormon Canyon Road Route, except in special cases, so as to be consistent with the Road User Agreement that will be agreed upon with Converse County.

An evaluation of existing conditions showed that the roadways and intersections encompassed by the alternative routes currently experience a minimal level of traffic demand and thus, the level of service and reserve capacity for those facilities are excellent. Given that existing traffic demands are relatively light in most areas, it is not expected that highway or intersection level of service will degrade such that traffic control or lane expansion improvements would be necessary for any of the associated streets or highways. The following paragraphs discuss specific elements related to expected traffic operations impacts.

Traffic Volumes

Based on the current proposed construction schedule, it is expected that the early months of the construction period for PWP I will produce the highest levels of project-generated traffic. As such, the analysis of future traffic impacts focuses on that time period of construction as a worst-case scenario.

In order to project traffic volumes for the peak construction scenario, it was necessary to calculate daily vehicular demands for component transport, construction activity and workforce commuter traffic. It was also necessary to determine how the project-generated traffic would be distributed among the potential access routes. This projection of construction traffic demand and distribution was calculated based primarily on information provided by WWI in regard to workforce scheduling, roadway improvements phasing, and expected materials transport routing. Although the overall number of construction and commuter trips generated by this project (approximately 46,900 trips) seems high, that volume would be spread out over two construction phases that would span approximately twelve months of work. Also considering that many of the materials production-related trips will be generated on-site, the net overall daily and peak hour traffic demand impacts for key study area intersections is relatively minor.

Table 6-19 below illustrates the expected levels of average daily traffic during the peak construction period for the wind park, including a nominal background traffic growth factor to account for miscellaneous growth and other unaccounted for traffic. The numbers assume that approximately 30% of the Projects' total construction traffic would be generated during the peak month each year.

Table 6-19 Peak Construction Projected Average Daily Traffic Volumes.

Location	Average Daily Traffic (vehicles/day)	Percent Increase (%)
Interstate 25 - Deer Creek Interchange	4,206	6%
Interstate 25 - East Glenrock Interchange	4,262	6%
Interstate 25 - La Prele Interchange	4,245	4%
Deer Creek Road - North of I-25	2,670	20%
Mormon Canyon Road - South of Birch Street	577	19%
Birch Street - Northwest of Box Elder Road	1,745	5%

Table 6-20 shows that expected increases in average daily traffic along key project access routes could range from 4% to 20% during the peak construction. However, it should be stressed that the greatest overall impact in terms of vehicular traffic will likely occur along the segments of Mormon Canyon Road that are reconstructed in order to accommodate transport vehicles. At this time, no specific information is available relative to sequencing and operations for the off-site road improvement portions of the project. As such, the ADT projections in Table 6.19 account for all workforce commuter traffic for this project (including roadway improvement crews), as well as WTG materials and component delivery, and ancillary support vehicle trips, but they do not necessarily account for all of the traffic that may be associated with the off-site road improvements.

Intersection Capacity

Intersection capacity for the peak construction scenario was calculated for study area intersections using site-generated traffic demand increases accounted for in the AM and PM peak hours. These calculations were not completed for the Cold Springs Road Route intersections, since that route will only be used under special circumstances. Based on this scenario, all of the intersection approaches were found to operate at an LOS B or better during both peak periods. No significant queues were projected through the capacity calculations. No deficiencies requiring mitigation were identified relative to intersection capacity. However, it should be noted that the capacity calculation results likely do not fully account for how slow moving and bulky some of the transport vehicles will be as they traverse these intersections. As such, additional, albeit transient, delays may be experienced by ancillary vehicles as oversized trucks navigate through intersections. Additional capacity impacts are likely to arise temporarily if any reconstruction is necessary for any of the intersections. Detailed capacity calculation results for the Peak Construction scenario are shown in Table 6-20 on the following page.

Highway Capacity

Arterial and freeway capacity was also evaluated based on the Peak Construction traffic demand scenario. Table 6-21 on the following page illustrates the results of the calculations. All of the highway and freeway segments are projected to operate at an LOS C or better during the design hour. In areas where roadway reconstruction traffic is heavy or where construction requires detours, slower speeds, etc., it is likely that highway capacity would be temporarily degraded.

Table 6-20 Peak Construction Intersection Capacity Calculation Results.

		Peak Construction 2011							
		AM Peak				PM Peak			
Intersection	Approach	Approach Volume (vehs)	Control Delay (s/veh)	LOS	Max Queue (veh)	Approach Volume (vehs)	Control Delay (s/veh)	LOS	Max Quesu e (veh)
Intersection Control					**Two-way Stop**				
Deer Creek Road and I-25 EB ramps	NB	6				7			
	SB	6	7.2	A	1	10	7.2	A	1
	EB	100	9.0	A	1	75	8.9	A	1
	Intersection	112	--	--	--	92	--	--	--
Intersection Control					**Two-way Stop**				
Deer Creek Road and I-25 WB ramps	NB	28	7.4	A	1	70	7.4	A	1
	SB	92				114			
	WB	3	8.7	A	1	3	9.0	A	1
	Intersection	123	--	--	--	187	--	--	--
Intersection Control					**Two-way Stop**				
Birch Street and 4th Street	NB	173	9.9	A	4	124	9.0	A	4
	SB	90	9.4	A	3	79	9.0	A	3
	EB	103	9.1	A	2	138	8.7	A	2
	WB	135	9.5	A	2	236	10.2	A	4
	Intersection	501	9.6	A	--	577	9.5	A	--
Intersection Control					**Two-way Stop**				
Birch Street and Mormon Canyon Road	NB	15	12.9	B	1	126	14.2	B	2
	EB	345				287			
	WB	243	8.2	A	1	206	8.0	A	1
	Intersection	603	--	--	--	619	--	--	--
Intersection Control					**Two-way Stop**				
Birch Street and I-25 WB on-ramp	NB	12	7.3	A	1	14	7.3	A	1
	SB	42				69			
	Intersection	54	--	--	--	83	--	--	--
Intersection Control					**Two-way Stop**				
Birch Street and I-25 WB off-ramp	NB	12	8.6	A	1	14	8.7	A	1
	WB	31	7.2	A	1	43	7.2	A	1
	Intersection	43	--	--	--	57	--	--	--
Intersection Control					**Two-way Stop**				
Birch Street and I-25 EB ramps	SB	36	7.3	A	1	46	7.3	A	1
	EB	12	9.0	A	1	13	9.2	A	1
	Intersection	48	--	--	--	59	--	--	--

Table 6-21 Peak Construction Highway/Freeway Capacity.

Location	Design Hour Volume (veh/hour) - AM/PM	LOS
Deer Creek Road - North of I-25	268/307	B/B
Mormon Canyon Road - South of Birch Street	51/132	A/A
Birch Street - East of Mormon Canyon Road	487/440	C/B
Interstate 25 - Deer Creek Interchange (EB or WB)	385/385	A/A
Interstate 25 - East Glenrock Interchange (EB or WB)	357/357	A/A

Safety

Regarding safety, the biggest concern will be related to potential conflicts between oversized transport vehicles and the normal everyday traffic stream during the construction period. Some sections of the access route roadways are very narrow, with travel lanes less than 12 feet wide and minimal shoulders. It will be critical to have all oversized vehicles escorted through these sections using flag cars and proper signage, lighting, or other means to warn approaching and following vehicles. Oversized vehicles also typically have very slow acceleration rates, particularly from a stopped position. Intersection approaches along each of the transport routes should be further evaluated in terms of intersection sight distance, so that the reduced startup and acceleration time for heavy vehicles is adequately considered.

Geometrics

The most significant impacts are likely to be related to roadway geometrics and structural integrity of roads, culverts, cattle guards, etc. The Mormon Canyon Road Route will likely require significant modification of intersections, horizontal curves, vertical curves, steep grades, culverts, and cattle guards. WYDOT has indicated that it will require PWP I, LLC and PWP II, LLC to enter into a road damage agreement(s) to account for any damage incurred by State roadway facilities. Converse County will require a similar agreement(s) prior to granting access and/or approval of reconstruction of their facilities. All necessary roadway improvements should be designed based on American Association of State Highway and Transportation Officials (AASHTO), WYDOT, Converse County and other applicable standards.

Conclusion

In accordance with PWP I, LLC and PWP II, LLC's County Road Use Agreements and its State Road Damage Agreements, intended to be in place in spring of 2011, impacts to area roads will be avoided and minimized by road improvements completed prior to construction, road maintenance activities during construction, and where necessary, road repairs following construction. Though impacts to traffic during construction may result in occasional inconvenience to area residents, such impacts are not anticipated to substantially impair the health, safety, or welfare of current and expected inhabitants in the area of site influence. Operation of the proposed Projects will result in negligible impacts to roads and an incremental increase in light vehicle traffic on Mormon Canyon Road.

6.16 CUMULATIVE IMPACTS

The ISC defines cumulative impacts as the combined impacts upon the environment or the social or economic conditions resulting from construction and operation of the proposed industrial facility and from construction and operation of other on-going or proposed developments in the area of site influence. Proposed facilities to be considered in cumulative impacts include those for which public information is available and/or are actively engaged in the ISC permit process. At present, no known industrial facilities are planned to be under construction in the area of site influence at the same time PWP I and PWP II are scheduled to be under construction. Thus, the Projects will not result in any cumulative construction-related impacts to the environment or social and economic conditions in the area. There are, however, other wind energy facilities in the area of site influence that will continue to be in operation in 2011 and 2012 when the proposed Projects are scheduled to become operational.

These facilities include:

Glenrock-Rolling Hills (GRH) Wind Energy Projects

In March 2007, the Industrial Siting Council voted to issue a permit for PacifiCorp Energy to construct and operate WTGs at its Glenrock-Rolling Hills Wind Energy Projects northeast of Rolling Hills, Wyoming. The projects were constructed in 2008 and 2009 and are currently operational. Combined, they consist of 158 WTGs with a combined nameplate capacity of 237 MW.

Campbell Hill Windpower (CHW) Project

In March 2009, the ISC voted to approve a permit for Three Buttes Windpower, LLC to construct and operate WTGs at its Campbell Hill Windpower Project site northwest of Glenrock, Wyoming. The project was constructed in 2009 and put into operation in December 2009. It consists of 66 WTGs with a combined nameplate capacity of 99 MW.

Top of the World (TOTW) Windpower Project

In December 2009, the ISC voted to issue a permit for Top of the World Energy LLC to construct and operate WTGs at its Top of the World Project site northeast of Glenrock, Wyoming. The project was constructed in September 2010 and will be operational in 2011. It consists of 110 WTGs with a combined nameplate capacity of just over 200 MW.

When combined with PWP I and PWP II, there will be 396 WTGs with a total nameplate capacity of 635.4 MW operating within the area of site influence for certain resources at the end of 2012. The only resources affected by the proposed Projects that are likely to incur long-term cumulative operational impacts when considered in combination with the three wind energy facilities described above are wildlife and scenic resources. For wildlife, cumulative impacts only apply to highly mobile species such as birds and bats that can range throughout the area encompassing the three existing and two proposed projects. Cumulative impacts to these resources are described below.

6.16.1 Cumulative Impacts to Terrestrial Wildlife

Permanent habitat disturbance resulting from implementation of the proposed Projects would comprise less than one percent of the study area. The overall disturbance footprint on all currently operating wind energy projects in Converse County is assumed to be comparably low; however, there may be cumulative impacts to the function of these habitats when viewed at the landscape scale.

GRH, CHW and TOTW have resulted in localized habitat loss, fragmentation, and disturbance and an increase of human presence and activity in rural areas that have considerable value to wildlife. As described in Section 6.9, above, the construction of the proposed Projects may cause temporary displacement of individuals for some wildlife species that might avoid the project sites in response to

construction activity. Although Project facilities have been sited to avoid impacts to raptor concentration areas (including ridge lines and prey concentration areas) and riparian corridors, there is likely to be some level of unavoidable impacts to birds and bats resulting from WTG operations. Combined with fatalities caused by other wind energy facilities in Converse and Natrona Counties there could be cumulative impacts to wildlife, particularly raptors, and will necessitate close monitoring by the project operators and the WGFD.

It is important to note that mitigation and protection measures including but not limited to seasonal construction timing restrictions and no surface occupancy restrictions for raptors and Greater Sage-Grouse have been implemented for GRH, CHW and TOTW. Additionally, these wind energy projects underwent robust preconstruction assessments, reviewed by state and federal agencies, to ensure that operational mortality risk levels were appropriate for construction of each facility. These measures have helped minimize cumulative impacts to wildlife species. Additionally, each of these projects is participating in scientific studies to further study wildlife impacts as required by agency monitoring and protection measures. Detailed scientific study results will lead to better understanding or direct and indirect, as well as cumulative wildlife impacts, to better develop and implement mitigation strategies and measures to further reduce wind energy cumulative wildlife impacts. All of these measures are being undertaken with PWP I and PWP II as well.

Avian species composition in the immediate vicinity of operating WTGs is likely to change from baseline conditions due to changes in habitat including reduced or altered vegetation and increased ambient noise. Species that use sparsely vegetated or unvegetated habitats and can tolerate noise are likely to become more common relative to those requiring vegetative cover and those intolerant of turbine-generated noise. These changes to the local landscape will likely result in long-term changes to avian use patterns, displacing some species away from wind energy facilities. Due to the prevalence of high quality native habitats in the region surrounding these five wind energy facilities, it is unlikely that displacement of birds resulting from wind farm operations will result in any discernible population impacts in the area of site influence.

Following construction of the proposed Projects, three years of post-construction wildlife monitoring will be initiated by PWP I, LLC and PWP II, LLC and its contractors. Bird and bat surveys will be continued in the two project areas and the reference site to determine if project operations are influencing the types of species using the two sites, the number of individuals, or their behavior. Another component of post-construction monitoring will be a fatality study. Statistically rigorous fatality monitoring will include

assessments of searcher efficiency and carcass removal rates to calibrate estimates of actual avian and bat fatality resulting from turbine operations. Fatality data will be compared with baseline avian use data and compared with the results of fatality studies at other wind power facilities (where available) to assess whether operational impacts to birds and bats is comparable to other operating wind farms in the region and to quantify cumulative impacts.

As described in Section 6.9, avian mortality at the Foote Creek Rim wind energy facility in Carbon County, Wyoming, has been documented at 1.50 birds per turbine per year or 2.34 birds per MW per year (Erickson et al. 2005). If the same mortality rates were applied to the three existing wind energy facilities in the area of site influence and the two proposed Projects, there could be between 596 and 1,487 birds killed annually at all five facilities. Of these, raptors could comprise between 14 and 34 of the fatalities.

Erickson, et al. (2005) estimated multiple sources of anthropogenic sources of bird fatalities. Proportionally, wind turbines account for less than 0.01 percent of all anthropogenic avian collisions. Buildings, power lines, and domestic and feral cats together account for 84 percent (approximately 780 million) of all avian fatalities per year. Considering all anthropogenic sources of avian fatalities, the small number of bird fatalities expected from the proposed Projects combined with other similar projects in the region, is not a significant cumulative impact. Even as the number of wind turbines in the United States increases, wind turbine-related bird fatalities would still cause no more than a small percentage of all collisions deaths related to non-windpower related structures (Erickson et al. 2005).

With a specific goal of examining cumulative impacts of wind energy facilities on birds and bats, Johnson and Erickson (2008) studied the Columbia Plateau Ecoregion in eastern Washington and Oregon. The study reviewed post construction bird fatality survey results from 11 operational wind farms in the same area. The purpose was to determine if concentrated wind energy development could cumulatively impact birds, or disproportionally impact certain species. The study found that when considered cumulatively, bird fatalities at all 11 locations are distributed amongst 77 species. When examined by type, (e.g. raptors, waterfowl, etc), no species or type was subjected to losses large enough to have a measurable cumulative impact.

Bat casualties have been reported from most wind power facilities where post construction fatality monitoring data are available. In Wyoming, the Foote Creek Rim Wind Energy Facility conducted an avian and bat mortality study between November 1998 and June 2002 (Young et al. 2003). The majority

of the recorded fatalities in the western US occur during the fall migration period, the species most often found during carcass searches were hoary bat and the silver-haired bat, each of which are considered by the State of Wyoming to be species of greatest conservation need but are not federally listed as threatened or endangered.

As indicated above, PWP I, LLC and PWP II, LLC will conduct post-construction avian and bat fatality monitoring in the study area. For PWP I, monitoring is planned to commence in January of 2012. Post-construction monitoring of PWP II will begin in January of 2013. A Wildlife Conservation Plan covering both proposed projects is currently being developed in conjunction with Project landowners and the WGFD in accordance with Appendix B of the WGFD *Recommendations* document. It is anticipated that the Projects' impacts on bats will be similar to those reported for other studies in Wyoming and the western U.S., which is generally low compared with wind energy sites located in forested habitats of the eastern U.S.

6.16.2 Cumulative Impacts to Scenic Resources

The cumulative impact analysis for scenic resources focuses on sensitive viewpoint receptors. In general, high viewer sensitivity exists when there are many viewers who have a frequent view or a view of a project area for a long duration, as well as those viewers who are likely to be very aware of and concerned about the view. This region of Converse County has a low population density, with the majority of the residents living in the towns of Glenrock or Rolling Hills or in nearby unincorporated rural Converse County. Interstate 25 provides extended views of wind energy project sites (but not the proposed Project sites), and for this analysis, views from these areas were considered.

As indicated above, the constructed projects have introduced 334 turbines to the landscape. Glenrock was the first commercial wind energy facility to be constructed in Converse County. Since then, Glenrock III, Campbell Hill, Rolling Hills, and Top of the World have been completed. Upon completion of construction, PWP I and PWP II will introduce an additional 62 turbines for a combined total of 396 WTGs in the area.

In general, the existing wind energy facilities have produced localized visual changes. Visual impacts resulting from these projects consist of the alteration of the previously open rangeland and sagebrush landscape to a rangeland and sagebrush landscape in which large wind turbines are visible. While some

WTGs are noticeable features along the skyline and may produce a vertical patterning to the landscape composition, their presence in these locations is in many cases attenuated by the distance between viewers and the facilities and the screening provided by topography.

The proposed Projects will cause a change in the visual character of the existing landscape. From Glenrock, these changes will be minor (see Section 6.11). Nonetheless, the Projects will introduce additional views of turbines to the Towns of Glenrock and Rolling Hills where turbines are already visible. No new turbines would be located closer than 9 miles to downtown Glenrock or 7.4 miles from I-25. The majority of residences in Glenrock would not be located closer than 8.5 miles from the proposed turbines.

The degree to which the Projects' turbines would dominate these views is dependent upon the distance from which they are viewed. According to a study conducted by CPRW, the WTGs have the greatest potential to be visually dominant within a radius of about two miles from the structures, and the degree of visual dominance tapers off to a moderate level after about 3.8 miles and a low level after about 9.3 miles (CPRW 1999).

As documented in Section 6.11, although the proposed Projects will be visible from Glenrock and Rolling Hills, from rural residential areas, and from Interstate 25 and Deer Creek Road, it will not produce changes to these views that would substantially affect critical visual resources. Although some of the proposed WTGs will be visible from these areas, they will be seen as distant landscape elements. Consequently, the PWP I and PWP II turbines, when considered in combination with other wind energy facilities in Converse County, will not contribute to cumulative viewshed impacts that are more substantial than the impacts created by the proposed Projects alone.

7.0 CONTROLS, MITIGATION, AND MONITORING MEASURES

A number of specific controls, mitigation, and monitoring measures will be implemented to assess, avoid, minimize, and compensate for impacts resulting from construction and operation of the proposed Projects. These measures can generally be classified as avoidance, prevention, and exclusionary actions. Implementation of these measures, when combined with those actions, design features, and permit requirements identified in the preceding chapters will ensure that the proposed Projects comply with all applicable laws, that they will not pose a threat of serious injury to the environment or to the social and economic condition of the current or expected inhabitants, and that they will not substantially impair the health, safety or welfare of the current or expected inhabitants in the affected area.

7.1 CONTROLS

A broad array of measures are being proposed to mitigate the exposure of people, animals, and facilities to potential hazards associated with construction and operation of the Projects. These measures can generally be classified as avoidance and minimization efforts.

The following control measures, in combination with setback distances, significantly reduce the likelihood of the general public coming within a hazardous distance of WTGs and electrical equipment. The Projects will be designed, constructed, and operated to adequately restrict public access from potentially hazardous areas without restricting landowners and landowner-approved public from enjoying traditional uses of project lands.

7.1.1 Avoidance

SWCA LLC developed a detailed site assessment of known and identified environmental constraints across the two project sites and used this information to determine the appropriate locations of site facilities. The process of identifying constraints and modifying the site plans to accommodate those constraints was an iterative process that resulted in a number of WTG and facility layout revisions over the course of months. The site plan presented in Appendix A (Map A-2) was designed to avoid impacts to Greater Sage-Grouse leks, raptor use areas (including prey concentration areas), aquatic and riparian habitats, and cultural resource sites. Consequently, the resulting preliminary site plan only utilizes areas that are most appropriate for development.

7.1.2 Prevention

The primary means of preventing hazards to project workers and the general public will be adherence to appropriate design and construction protocols such as the International Electrotechnical Commission (IEC) 61400-1: Wind Turbine Generator Systems – Part 1: Safety Requirements (International Electrotechnical Commission (IEC) 1999). This will ensure that project designs, construction standards, and safety features are in accordance with industry norms and benefit from the experience of many manufacturers and operators.

A second important form of prevention is the establishment of a skilled and knowledgeable workforce and implementation of effective facility-wide maintenance, monitoring, compliance, and security programs. This includes the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), Spill Prevention, Control, and Countermeasures (SPCC) Plan; Emergency Response Plan; and Fire Protection and Prevention Plan; as well as consultation with the appropriate local agencies.

7.1.3 Exclusion

Every hazard identified herein decreases as some function of linear distance from the facilities. In many cases it has been possible to reduce or eliminate hazards to persons and facilities by prohibiting or controlling their presence in the area of site influence. Where multiple hazard area overlaps, the largest distance should govern. Portions of the PWP I and PWP II project sites will have controlled access (e.g. O&M Building equipment yard, collector and interconnection substations), and access to the facilities will be limited to persons who are knowledgeable of safety measures and potential risks.

7.1.4 Restricted Public Access

The Projects and appurtenant facilities will be located on a combination of private fee and State of Wyoming lands. All of the State of Wyoming lands within the Project boundary are predominantly surrounded by private fee lands, and public access is generally limited to the Mormon Canyon Road right-of-way. Each WTG will have an internal ladder with safety platforms for access to the nacelle and a locked entry door at ground level to prevent unauthorized individuals from climbing the tower. Step-up transformers will be located within locked cabinets at the base of each tower. Additionally, PWP I, LLC and PWP II, LLC will restrict public access to any related or supporting facilities that could pose a

potential safety threat (e.g., the on-site collector substation will be located within a fenced area with a locked gate). Security personnel will be present throughout construction, and the O&M facility will be staffed continuously during business hours. These measures are similar to as those currently in place on other wind development projects in Wyoming, and have proven successful in mitigating potential harms.

7.1.5 Health and Safety Measures

PWP I, LLC and PWP II, LLC, including their EPC Contractor(s) and O&M staff, are committed to a safe and healthy workplace that promotes a zero-accident culture. We are committed to continuous improvements to identify and control risks so that company safety metrics and performance meets the goal of zero incidents. To meet this commitment, the Projects' health and safety policies will require the following.

- Operate in compliance with or exceed all health and safety government laws, regulations, ordinance, standards, and permit requirements
- Ensure all employees are involved in health and safety programs with appropriate training and communication to work responsibly, make decisions to carry out their duties, and be accountable for the results
- Provide health and safety plan and structure that ensures health and safety management with risks, impacts, and legal requirements controlled through appropriate actions and governance
- Mandatory drug and alcohol testing for all employees.
- Ensure the health and safety are set and communicated to all employees and that performance is monitored to promote continuous improvement.
- Work to proactively prevent incidents, accidents, and environmental damage before these occur through sustainable actions and process improvements at all locations
- Enable real-time communication on site through the installation and use of a two-way radio system that will be employed throughout construction and during operations of the facility.

7.1.6 Worker, Environmental, and Facility Controls

There are no health and safety standards specific to the siting or operation of wind energy facilities, but safety standards relevant to construction will be applied. In addition, in an effort to prevent injury and

damage to the environment and public and private property, conditions or actions that may put workers, the environment, or the facility at risk have been identified. WWI has taken measures to avoid these conditions and actions and minimize the potential for an incident to occur. We will effectively address incidents if they do occur. Careful planning and design of the facility and its components are in place to protect both workers and the general public during construction and operation of the facility.

7.1.6.1 Emergency and Law Enforcement Services

Access to the proposed project sites will occur via Mormon Canyon Road and, if necessary, Highway 91 and Windy Ridge Road, for the construction period and the operational life of the Projects. Response times for emergency crews will be dependent on the final access route approved for emergency crews from Converse County departing Douglas and/or Glenrock. Converse County Rural Fire Association crews located on private land bordering the Projects will not be significantly impacted by this determination. Though no portion of the project sites or access to the sites are located in Natrona County, several agencies within the county were contacted and expressed their willingness to respond, if needed, under a mutual aid agreement between the counties. Jay Johnson, EMS Director for Converse County Memorial Hospital, confirmed that 911 calls from Converse County are routed to Natrona County in the event that the Wyoming Medical Center's Life Flight services are deemed the most appropriate response to a remote location.

It is the intent of PWP I, LLC and PWP II, LLC to participate in discussions with the construction manager for the EPC Contractor(s) and affected emergency response and law enforcement agencies including the Converse County Emergency Management Agency, the Converse County Sheriff's Department, the Converse County Rural Fire Association, Memorial Hospital of Converse County Ambulance Service, and the Glenrock and Douglas police and fire departments to establish emergency response protocols and plans for accident response on the PWP I and II sites and along the project access routes. Such plans would include, for example, providing emergency services with GPS coordinates of individual towers so the precise location of any incident can be easily identified. It is also the goal of the EPC Contractor(s) and WWI that these discussions result in a mutually agreed upon Emergency Response Plan for construction and operations of the PWP I and PWP II sites.

7.1.6.2 Medical Emergencies

Medical emergencies on the project sites or otherwise related to construction or operation of the Projects will be reported through 911 and by alerting EMS authorities. Calls to 911 from the Project sites would go to the Converse County Sherriff, where the appropriate ambulance crews are paged for dispatch. The first responders would be determined by the type and location of the emergency and the capabilities of the emergency response service. The MHCC Ambulance Service Douglas station has three units manned by a full-time paid crew with a back-up crew. The Glenrock station has two units manned by volunteer crews contacted through a pager system. The responding team will transport the patient to either Converse County Memorial Hospital in Douglas or the Wyoming Medical Center in Casper.

As previously noted, serious 911 emergency medical incidents are typically handled via helicopter service provided by the Wyoming Medical Center's Life Flight, which would transport patients to the Wyoming Medical Center. The EPC Contractor(s) will also coordinate with Wyoming Life Flight to ensure that landing zone requirements are met at all times. In addition, the EPC Contractor(s) will proactively ensure that all personnel will be provided adequate training in rescue techniques used while working in turbine towers and nacelles.

Converse County Memorial Hospital is a 25-bed critical access, acute-care facility. Wyoming Medical Center is a 207-bed acute-care regional facility with a Level 2 Trauma Center.

7.1.6.3 Fire Emergencies

The PWP I and PWP II project sites are located entirely within Zone 6 of the Converse County Rural Fire Association. Fire emergencies will be reported through the Zone 6 Fire Warden rather than by calling 911. The Fire Warden coordinates the Zone 6 personnel (seven volunteers live near the project area) and equipment (three 800 gallon and five 200 gallon response vehicles). Secondary response is requested from Glenrock or Douglas Fire Departments, if needed. In addition, should air support be needed for water drops, the CCRFA has access to the State Forestry Helicopter sited within Zone 6 boundaries. PWP I, LLC and PWP II, LLC and will provide the Zone 6 Fire Warden with maps detailing WTG locations and access routes prior to construction and consult the Warden in drafting the PWP I and PWP II Emergency Response Plan (Reed 2010, Grant 2010).

The Glenrock Fire Department operates two fire stations, one in Glenrock and one in Rolling Hills. Both stations are staffed by volunteers, 25 in Glenrock and 15 in Rolling Hills. Both stations are equipped with rapid-response wildland fire trucks, aerial units, pumpers, and multiple water tenders. Additionally, the Glenrock Fire Department houses a rescue unit. The Douglas Fire Department is staffed by a 45-member volunteer team and equipped with rapid-response wildland fire trucks, an aerial unit, several pumpers, one platform truck, and a rescue unit.

7.1.6.4 Law Enforcement

The Converse County Sheriff's Department will provide law enforcement services to the PWP I and PWP II project sites and along access roads outside of municipalities.

7.1.6.5 Occupational Hazards

As with any construction project, construction and operations workers are subject to risk of injury or fatality from physical hazards. While such occupational hazards can be minimized when workers adhere to safety standards, accidents can still occur. Occupational health and safety are regulated at the federal level through the Occupational Safety and Health Administration (OSHA) (29 U.S. Code [USC] 651 *et seq*.) Wyoming has additional statutes and regulations that build on the federal law.

Some of the occupational hazards associated with wind energy projects are similar to those of the heavy construction and electric power industries, while others are unique to wind energy projects (e.g., heights, high winds, energized systems, and rotating/spinning equipment). In particular, the hazards of installing and repairing WTGs can be similar to those of building and maintaining bridges and other tall structures.

The WTG manufacturer, GE Wind, will provide an O&M manual and hands-on training that will include system safe operating limits and descriptions, startup and shutdown procedures, alarm response actions, and an emergency procedures plan. Having the turbine supplier providing the training will ensure the highest safety standards for the operation of the projects.

PWP I, LLC and PWP II, LLC its subcontractors will comply with all applicable local, state, and federal safety, health, and environmental laws, ordinances, regulations, and standards. Some of the main laws,

ordinances, regulations, and standards created to protect human health and safety that will be reflected in the design, construction, and operation of the project include:

- Occupational Safety and Health Act of 1970 (29 USC 651 et seq.) and 29 Code of Federal Regulations (CFR) 1910, Occupational Safety and Health Standards
- Americans with Disabilities Act (ADA) for accessibility at the O&M building
- Uniform Fire Code Standards
- Uniform Building Code
- National Fire Protection Association (NFPA), which provides design standards for the requirements of fire protection systems
- National Institute for Occupational Safety and Health (NIOSH), which requires that safety equipment carry markings, numbers, or certificates of approval for stated standards
- National Electric Safety Code
- American Concrete Institute Standards
- American Institute of Steel Construction Standards
- American Society for Testing and Materials
- National Electric Code

There is little or no cellular phone reception in the project area. Thus, PWP I, LLC and PWP II, LLC will require their EPC Contractor(s) crews to carry or have ready access to satellite phones to ensure that 911 or other critical calls can be made from the project sites in case of emergency. Crews and individuals not carrying satellite phones will have two-way radio contact with those that do.

7.1.6.6 Public Safety/Security

Warning signs will be posted along access roads as permitted to inform the public of construction activities and advise the public to not enter the site. Signs will also be posted to direct construction traffic to stay on the Projects' access roads and to prevent construction traffic unnecessarily entering public roadways when avoidable. For areas where public safety risks could exist and site personnel would not be available to control public access (such as excavated foundation holes and electrical collection trenches), warning signs and temporary fences would be erected. Fencing may also be installed around material storage, staging, and/or laydown areas. Other areas determined to be hazardous, or where security or theft is of concern, may also be fenced. Temporary fencing around unfinished turbine bases, excavations, and other hazards will typically be high-visibility plastic mesh. Security guards, cameras,

and/or additional fencing will be used as necessary to protect public health and safety as well as Project Facilities.

7.1.6.7 Traffic Management

Construction

The potential for any traffic issues will be highest during construction of the Projects when worker traffic is at its peak and deliveries of materials and equipment will occur. A traffic study has been completed (see Section 6.15) that details roadway characteristics and the number and nature of vehicle trips to, from, and within the Project area.

WWI and its transportation consultant, Civil Environmental Professionals, Inc. (CEPI) of Casper, and in some cases the turbine manufacturer, GE Wind, have been in consultation with the Town of Glenrock, City of Douglas, Converse County, and the local Wyoming Department of Transportation (WYDOT) District to ensure the execution of a well-coordinated transportation plan that will minimize risks and inconvenience to the public. The plan is focused on traffic and circulation on Mormon Canyon Road, Windy Ridge Road, and the main intersections where traffic associated with construction of the proposed Projects is most likely to affect the public, e.g., East Glenrock Interchange and the Birch Street – Mormon Canyon Road intersection. The transportation plan is designed to minimize potential hazards from increased truck traffic and worker traffic and to minimize impacts to traffic flow on the main access routes to the proposed Projects. The plan will be finalized with WYDOT once final turbine component routing has been established in consultation with the Projects' turbine vendor. Prior to construction, PWP I, LLC and PWP II, LLC will also execute a Road Use Agreement with Converse County and a Road Damage Agreement with WYDOT to ensure that roads used during construction of the Projects are properly improved, maintained, and repaired prior to, during, and after construction.

Operation

During operations, the Projects will run continuously (24 hours per day, 7 days per week) using an automated system. They will employ an anticipated 6 full-time O&M employees, with an incremental daily increase in traffic to and from the sites as necessary.

7.1.6.8 Electromagnetic Fields

Electromagnetic fields (EMFs) are associated with electrical currents and are not specific to wind power projects. EMFs can be considered a possible hazard when associated with the siting of high-voltage (greater than 115 kV) overhead transmission lines in close proximity to residences.

EMFs are generally not an issue with respect to WTGs, which have low-voltage drop cables (690 volts) contained within steel towers and have a predominately underground collection system, also at low voltage (34.5 kV). Exposure of individuals working within and around WTGs to EMFs generated by the Projects is minimal because of these low voltages. Distribution lines used to supply energy to the O&M building and the WTGs (when they are not running) will also be low voltage (34.5 kV) and will be located underground and/or cross areas that are not inhabited or used on a regular basis, so long-term exposure of individuals to EMFs would not occur.

As with any transmission line, EMFs could be generated by the two Project's approximately 5-mile long, 230 kV transmission line. The potential for EMF exposure from the Projects is anticipated to be very low because the line traverses undeveloped land. The high voltage transmission line has been sited to avoid occupied residences and developed areas where people would be present for any extended period of time. The closest residence is located approximately 0.8 mile from the proposed route for the overhead transmission line and it belongs to a participating landowner. The transmission line will be designed and built according to industry standards to minimize the potential for EMF impacts. Thus, EMF impacts from the proposed transmission line are not anticipated to be significant.

7.1.6.9 Lightning

East-central Wyoming is not a highly lightning-prone area. Nevertheless, the potential for lightning strikes has been considered in the design of the proposed Projects and their structures. Because the WTGs will be the highest structures in the surrounding area, the probability of lightning striking them, should there be an electrical storm in the immediate area, is relatively high. The mitigation measures in place are designed to minimize this risk significantly. The WTGs and the substations will be equipped with specially engineered state-of-the-art lightning-protection systems. Every wind turbine foundation will have grounding equipment to discharge electrical energy into the earth should the wind turbine build up an electrical charge as a result of being struck by lightning or in the case of an equipment malfunction.

The grounding equipment may consist of a copper cable grounding mat cast in place when the base is constructed or some other grounding method specified by the turbine manufacturer. The substation will also have grounding equipment, which may consist of a grounding grid laid below grade in trenches around the substation site or other grounding methods to further protect equipment and personnel.

Other project features equipped with grounding apparatus include transmission towers and meteorological towers. During construction, the grounding crew follows behind the tower assembly and erection crew, installs the proper number of grounding rods, and measures the ground resistance. If the proper ground resistance has not been achieved, additional ground rods are installed until appropriate ground resistance is obtained. On rocky sites with little to no soil mantle, adequate electrical grounding may be problematic and may require the installation of a grounding well reaching to the uppermost saturated zone below the ground surface.

7.1.6.10 Aviation Lighting

The WTGs will be grouped in arrays and it is expected that up to half of the WTGs will require FAA-mandated aviation warning lights. The lights will likely be red strobes or strobe-like lights that produce momentary flashes interspersed with dark periods up to 3 seconds in duration. All lights will fire synchronously. The number and location of WTGs with lights and the lighting pattern of the WTGs will be determined through consultation with the FAA prior to construction.

In order to preserve dark skies over the Projects to the extent feasible while meeting FAA safety standards, PWP I, LLC and PWP, II LLC intends to use a radar-based aviation lighting management system that activates the aviation lights only when there are low-flying planes in the proximity of and heading toward the Projects. This system will leave the nighttime sky free of unnecessary light pollution thus decreasing public annoyance issues and minimizing the environmental effects of lighting.

7.1.6.11 Shadow Flicker

Shadow flicker caused by WTGs is defined as alternating changes in light intensity caused by the rotating turbine blades casting moving shadows on the ground and other stationary objects, such as a dwelling. No shadow flicker is created when the sun is obscured by clouds, fog, or when the turbine is not rotating. Shadow flicker only has an effect if there is a sensitive receptor in close enough proximity to the WTG

that the turbine blades' shadow is cast upon it on a regular basis. Since the length and location of turbine shadows and the amount of time they are cast on any given point within this range varies throughout the day and year depending on the angle of the sun, shadow flicker is most common in the immediate vicinity of WTGs. Potential receptors such as residences or sensitive wildlife habitats (e.g. sage-grouse leks) that are more than a few hundred yards away from a turbine only experience shadow flicker for short periods in the morning or evening or during the winter when the sun tracks low in the southern sky. There are no residences in close enough proximity to the Projects to be adversely affected by shadow flicker. Shadow flicker from WTGs in PWP I may reach the Morman Canyon Lek for a brief period in the morning but given the quarter-mile buffer between this lek and the nearest turbine array, any adverse effect would be of short duration. Similarly, shadow flicker from the easternmost turbine array in PWP II could reach the New Lek but again, the quarter-mile buffer would limit the duration of its effect.

7.1.6.12 Mechanical Failure

The GE 1.6-MW WTGs that will be used for the Projects meet international engineering design and mechanical safety standards for tower, blade, and generator design. There are over 12,000 GE 1.5-MW and 1.6-MW WTG's (essentially the same turbines) in operation today located in the United States and Canada. From 2006-2010, the availability of these turbines has been at or above 97 percent. There is an international quality control assurance program for WTGs, along with a number of relevant safety and design standards. The lead organization for development of international standards for WTG system is the International Electrotechnical Commission (IEC), and the most broadly applied standard covering machinery and structures is IEC 61400-1: Wind Turbine Generator Systems - Part I: Safety Requirements (IEC 2005). In the United States, the American Wind Energy Association (AWEA) is the designated organization on IEC committees.

Independent agencies are retained by WTG manufacturers to certify that the design and construction of a given turbine/tower assembly conform to internationally accepted standards in terms of design load assumptions, construction materials and methods, control systems, and safety measures. This is a generalized type of certification provided at the manufacturers' expense. Once a specific system make and model are selected, the user then customarily funds a second independent certification attesting to the applicability of the system design and commissioning checks address potential failure from extreme events such as earthquakes or extreme wind loadings, as well as frequency tuning of the different parts of the structure to avoid failure from dynamic resonance.

7.1.6.13 Turbine Certification

Because wind has been a common energy source for decades, European manufacturers have been required to meet rigid standards verifying their design criteria, operational characteristics, supervision of construction, transportation, erection, commissioning, testing, and servicing. In Europe, Germanischer Llyod (GL), Det Norske Veritas (DNV), Wind Test GmbH, and Risø (Denmark) are independent testing laboratories that administer regulations for the design, approval, and certification of wind energy conversion systems. As of yet there are no well-established testing laboratories in the United States that offer the amount of experience, scrutiny, and knowledge of these European agencies. Therefore, the Projects will implement turbine technology that, at a minimum, complies with European standards.

WTGs designed to the European standards have been proven to be the most reliable wind energy systems over the past two decades. In Europe, certification pursuant to these standards is mandatory for both permitting and financing. Partly because of these verification programs, lenders in Europe view wind energy there in the same way as lenders in the United States view the purchase of heavy construction equipment.

The Projects will implement WTGs that have achieved this type of certification by a reputable and experience third-party verification institute such as GL, DNV, Wind Test, or Risø and that demonstrate a minimum design life of 25 years.

7.1.6.14 Braking System

The electrically actuated individual blade pitch system acts as the main braking system for the WTG. Braking under normal operating conditions is accomplished by feathering the blades out of the wind. Any single-feathered rotor blade is designed to slow the rotor, and each rotor blade has its own back-up battery bank to provide power to the electric drive in the event of a grid line loss. Three independent back-up battery packs or spring units are provided to power each individual blade pitch system to feather the blades and shut down the machine in the event of a grid line outage or other fault. Having all three blades outfitted with independent pitch systems provides redundancy of individual blade aerodynamic braking capability.

Each WTG is also equipped with a mechanical brake located at the output (high-speed) shaft of the gearbox. This brake is applied automatically and immediately on certain emergency stops (E-stops) which may be triggered by component failures, grid loss, excessive vibrations, and other factors. The brake also prevents rotation of the machinery, so its application is required by certain service and maintenance activities.

7.1.6.15 Turbine Control

The WTG can be controlled automatically or manually from either the control panel located inside the nacelle or from a computer located in a control box at the bottom of the tower. Control signals also can be sent from a remote computer via the SCADA system, with local lockout capability provided at the turbine controller.

Using the tower-top control panel, the machine can be stopped, started, and turned out of the wind. Service switches at the tower top prevent service personnel at the bottom of the tower from operating certain turbine systems while service personnel are in the nacelle. To override any machine operation, stop buttons located in the tower base and in the nacelle can be activated to stop the turbine in the event of an emergency.

7.1.6.16 Construction Waste Management

Waste management control procedures will be implemented as previously set forth during the construction phases of the Projects.

Solid Waste Management

The generation of solid waste during the construction phases will be handled by a solid waste hauling and management firm contracted by PWP I, LLC, PWP II, LLC or their EPC Contractor(s). WWI has approached Waste Connections of Wyoming and discussed the two project's estimated weekly construction solid waste generation. Waste Connections has indicated that two facilities in the area will accept construction waste, one in Glenrock and one in Casper.

Portable haul-off 30-cubic yard dumpsters would be delivered to the Project sites and used to collect construction-generated waste materials. Currently, there are 3 roll-off companies near the PWP I and II sites: Waste Connections, Waste Management, and Power Services Company. The EPC Contractor(s) will solicit waste management bids prior to construction initiation. The contracted waste hauler will remove the portable dumpsters on a regular basis (7-10 times weekly during height of construction activities) and ensure proper treatment and disposal. There are no plans to store or treat solid waste at the Project sites.

Fuel and Oil Storage

With respect to the disposal of used oil during construction and operations, the EPC Contractor(s), PWP I, LLC and PWP II, LLC will have designated collection points for the Projects. Collection points will consist of 55-gallon drums placed on secondary containment pallets in temporary structures during construction and in permanent structures during operations. It is anticipated that used oil generated and stored at the site will not exceed two or three 55-gallon drums during normal operations. Larger amounts of used oil are expected to be temporarily stored on site during scheduled oil changes for the WTGs, which are expected to occur every three years. The EPC Contractor(s), PWP I, LLC and PWP II, LLC will comply with the applicable sections of the Federal Standards for the Management of Used Oil (40 CFR Part 279) and will contract with appropriate firms to remove used oil from the site for disposal at properly licensed facilities.

Aboveground fuel storage tanks will be used by the General Contractor(s) to facilitate on-site equipment refueling. The storage tanks will comply with applicable rules and regulations. No underground tanks will be used during construction or operation of the projects. All aboveground fuel tanks will have secondary containment systems.

Hazardous Wastes

It is anticipated that minimal or no hazardous wastes will be generated during construction of the Projects and that the Projects will qualify for Conditionally Exempt Generator Status under the Resource Conservation and Recovery Act (RCRA). Potential generation of hazardous wastes could include waste paints, solvents, and lubricants. The quantities of such wastes are expected to be well below regulatory thresholds for being considered Small-Quantity or Large-Quantity Generators under RCRA. Potential

U.S. Environmental Protection Agency (EPA) waste codes generated include D001, F003, and F005 wastes.

Any such wastes that are generated will be properly characterized and managed by the EPC Contractor(s), by PWP I LLC and PWP II, LLC using established SPCC protocols. It is not anticipated that any onsite treatment, storage, or disposal will occur that would require obtaining hazardous waste permits during the construction period. In addition, any wastes generated from a release will be properly characterized and managed by the EPC Contractor(s) and by PWP I, LLC and PWP II, LLC.

Spill Management

The EPC Contractor(s) will develop and implement a SPCC Plan in accordance with Federal standards for oil pollution prevention (40 CFR Part 112) and Solid Waste Rules and Regulations. If fuels and/or other petroleum-based products are spilled during construction of the Projects, a treatment/disposal facility currently permitted by the Solid and Hazardous Waste Division will be contracted to dispose and manage the contaminated soils. The General Contractor(s) will contract with properly licensed firms to clean up contaminated area properly dispose of any oily wastes generated as a result of such releases.

7.1.6.17 Operations Waste Management

Appropriate waste management procedures will be implemented during the operation of the PWP I and PWP II.

Fuel Storage

The Projects will include an operations and maintenance (O&M) facility which will store lubricants, oils, grease, antifreeze, degreasers, and hydraulic fluids used in the operation and maintenance of the facility. Spent lubricants, oils, grease, antifreeze, degreasers, or hydraulic fluids will be temporarily held in the O&M building while waiting for delivery to a certified recycling center. The above listed materials will be stored in approved containers located above ground. It is not anticipated that fuel storage will be required on site during operations.

Hazardous Waste

The production, use, storage, transport, and disposal of hazardous materials associated with the proposed Projects will be in strict accordance with federal, state, and local government regulations and guidelines. No extremely hazardous materials, as defined by 40 CFR 355, are anticipated to be produced, used, transported, or disposed of as a result of the operation of the facilities.

During the operations it is anticipated that hazardous waste generation will be either zero or minimal and will be well below the regulatory thresholds for small-quantity or large-quantity program requirements. Once the Projects are in operation, PWP I, LLC and PWP II, LLC will contract services for oil waste disposal from the site. Hazardous material wastes, if generated, will be used and handled in a manner that is protective of human health and environment and that complies with all applicable federal, state, and local rules and regulations.

The WTGs and transformers will likely use and/or require the following lubricants, oils, greases, antifreeze, cleaners, degreasers, and hydraulic fluids (or comparable products from other manufacturers):

- Simple Green (cleaner and degreaser)
- Oil-Flo (Cleaner and degreaser)
- Mobil SHC 632 (Gear Oil)
- Mobilux EP1 (grease)
- Mobil SHC 524 (hydraulic fluid)
- Shell DIALA (R) A oil (mineral oil used as transformer coolant)
- Ethylene glycol (standard commercial antifreeze used in radiators)

None of the above listed products contains any compounds listed as “extremely hazardous” by the EPA. These products will be used in moderate quantities and will be contained entirely within the spill trap and nacelle, minimizing the possibility of accidental leaking. Lubricants, oils, antifreeze, and hydraulic fluids will be checked in accordance to the periodic regular maintenance schedules recommended by the WTG manufacturer. The schedule calls for fluid checks more often in the first year and then every 6 months thereafter. Fluids will be replenished as needed or as recommended by the manufacturer. Fluids will be replaced up-tower, where any accidental spills will be contained by a spill trip located within the nacelle. Spent lubricants, oils, greases, antifreeze, cleaners, degreasers, and hydraulic fluids will be brought back to the O&M building for temporary storage before being recycled by a licensed waste disposal contractor.

Cooling oil used in the transformers does not contain PCBs. The transformers will be inspected regularly.

Towers and other ancillary equipment will arrive on site already painted and will rarely need to be repainted during the life of the equipment. Should any repainting be needed, it will be performed by qualified, licensed contractors.

In consultation with the Converse County Weed and Pest Control District, herbicides may be used to minimize the potential for introduction or spread of noxious weeds. Herbicides will be applied either by the landowner or by a licensed professional who will select the appropriate herbicides and apply them in accordance with EPA requirements.

Spill Management

Accidental releases of hazardous materials, such as vehicle fuel during construction or lubricating oil for WTGs will be prevented or minimized through proper containment of these substances during use and transportation to the site. Lubricating oils will be used primarily within the WTGs themselves, where any spill will be contained. Any oil waste, rags, or dirty or hazardous solid waste will be collected in sealable drums and removed for recycling or transported and disposed of by a licensed contractor.

In the unlikely event of an accidental hazardous or non-hazardous materials release, any spill or release will be cleaned up, and the contaminated soil or other materials will be disposed of and treated according to applicable federal, state, and local environmental laws and regulations. A spill kit (which contains items such as absorbent pads) will be appropriately located on site to respond to accidental spills if any were to occur. Employees handling hazardous materials will be instructed in the proper handling and storage of these materials as well as where spill kits are located.

7.2 MITIGATION MEASURES

By following industry guidelines and turbine certification processes, PWP I, LLC and PWP II, LLC will construct safe, reliable, and state of the art facilities. Adequate safety devices, company operational policies and plans, and testing and commissioning procedures will be in place to further ensure safe construction and operation of the Projects.

7.2.1 Failure of Machinery and/or Structures

Mitigation for or prevention of impacts from mechanical or structural failure(s) will be achieved by a combination of adherence to all appropriate engineering and construction regulations, careful planning and controlled site access. WTGs are equipped with multiple safety systems as standard equipment. Critical components have multiple temperature sensors and a control system to shut the system down and take it off-line if an overheating condition is detected. Lightning protection is standard on the WTGs, and an engineered lightning protection and grounding system will be specificially designed, engineered, and installed for the Projects as described above.

7.2.1.1 Safety Setbacks

WWI has adhered to and gone beyond Converse County standards regarding facility setbacks from county roads and property lines in order to ensure safe construction and operation zones:

Roads

- Mormon Canyon Road: Converse County requires setbacks equal to 1.1 times the height of the WTGs or approximately 440 feet. Under the current site plan, the nearest turbine to Mormon Canyon Road in PWP I is approximately 690 feet away. In PWP II, the nearest turbine to Mormon Canyon Road is approximately 1,420 feet away.

Occupied Residences

- Participating residences: 0.7 mile buffer
- Non-Participating residences: 0.9 mile buffer

7.2.1.2 Blade and Blade Fragment Throw

During construction, the turbine manufacturers' recommended handling instructions and procedures will be implemented to prevent damage to towers or blades that could lead to failure. In addition, certification of the WTG's to the requirements of IEC 61400-14 will ensure that the static, dynamic, and defined-life fatigue stresses in the blade will not be exceeded under the combined load cases expected at the Project sites. The standard includes safety factors for normal, abnormal, fatigue, and construction loads. This

certification, together with regular periodic inspections, will give a high level of assurance against blade failure in operation.

Blade fragment throw is a safety hazard, that may occur if a rotor blade breaks during rotation, resulting in the ejection of a portion of the blade. Blade fragments can be thrown for a number of reasons, although such occurrences have been extremely rare and have primarily occurred with older, smaller WTGs that will not be employed at the Projects.

The potential for fragments of the blade being thrown is similar to the ice throw concern below. Lightning strikes causing blade failures have been documented. Acts of vandalism, such as gun shots, could also conceivably damage rotor blades, causing a blade fragment to be thrown. Any persons, animals, facilities, and structures within the fragment throw hazard zone could conceivably be at risk of being struck. However, the Projects are not expected to result in any blade fragment throw risk due to the distance of WTGs from residences and public roads, and the extremely low likelihood of blade fragment throw occurring.

Modern wind turbines are so safe they successfully operate near schools, in urban settings and densely populated areas, and in rural communities. Blade and blade fragment throws were common in the industry's early years, but are unheard of-today because of better turbine design and engineering. None of the thousands of modern wind turbines in the U.S. have experienced a blade throw or a blade fragment.

7.2.1.3 Ice Throw

Under the correct conditions, ice may accumulate on the tower, nacelle, or blades. If the blades are rotating, it is possible for ice fragments to break free and be thrown, though mathematical models and statistical calculations indicate that the probability of an ice throw incident are very low. In the event of such an event, the distance ice may be thrown depends on the rotational speed of the blade, mass of the ice, wind speed and direction, aerodynamic properties of the ice fragment, and air density (among other variables). Ice throw, while it can occur under certain conditions, is of little danger. In addition, ice buildup slows a turbine's rotation and will be sensed by a turbine's control system, causing the turbine to shut down. The Converse County setbacks used are sufficient to protect against this rare ice throw danger to the public.

7.2.1.4 Wind Turbine Collapse

Tower collapse is extremely unlikely, as the foundations are designed to the Wyoming State Building code, which has adopted the provisions of the 2006 International Building Code (IBC). The Projects will employ a modern turbine design, including a safety system ensuring that the WTG is shut down immediately at the onset of mechanical problems such as nacelle vibration, overspeed, grid electrical disorders, or loss of grid power. Seismic provisions contained in this code will require specific engineering considerations based on the site-specific seismic conditions. The towers and associated foundations are designed to withstand a 3-second, 130 mph gust per IEC standards. Turbine towers will incorporate structural designs capable of withstanding large seismic events, high winds, and flooding. In addition, towers and foundations will be located outside areas known to be prone to flooding. Because all turbine structures would employ construction procedures certified as described previously, the hazard of a potential tower collapse is low.

7.2.2 Air Quality

7.2.2.1 Construction - Methods for Control

Fugitive Dust - Sources of fugitive dust during construction include access road improvements and construction; clearing and grading of the temporary staging areas, parking areas, concrete batch plant, substations, crane pads, transmission line; and excavation of the underground collection and communication system and turbine foundations. A fugitive dust control plan will be developed and implemented by the EPC Contractor(s) and include measures such as applying water or dust suppressants to exposed soil/material piles to control and prevent the creation of dust associated with construction activities. The use of water trucks to wet the surface of unpaved access roads and other potential work area sources of fugitive particulate matter will be used as appropriate during construction activities. Graveling permanent roadways and imposing appropriate speed limits on each of the Projects' roads will minimize sources of fugitive dust during construction.

Water trucks will be the primary means of dust abatement during all phases of construction. Water trucks will be used as appropriate during construction activities to wet the surface of access roads and potential work area sources of fugitive particulate matter. These measures are expected to reduce dust during construction to levels that have no significant impact on air quality, vegetation, or wildlife species.

Particulate Matter - The concrete batch plant will include appropriate filtration in accordance with the required air quality permit. The plant contractor or subcontractor and the holder of the issued air quality permit will be responsible for ensuring that the batch plant is operated in accordance with the issued permit conditions.

The use of a portable batch plant on private fee lands for making concrete would be a permitted source (i.e., the plant would have an operating permit with emissions limitations issued by the state of Wyoming). A WDEQ-AQD permit will be required prior to the operation of the batch plant pursuant to Chapter 6, Section 2 of the WDEQ's Standards and Regulations. Therefore, the resulting construction emissions will not result in a significant detriment to or significant impairment of the environment or the social and economic condition of present or future inhabitants in the area of site influence.

7.2.2.2 Operations - Methods for Control

Because no air emissions will be generated from the operation of the WTGs or substations, no additional method of control has been proposed or should be necessary. PWP I and PWP II, LLC will minimize O&M vehicle emissions by ensuring proper maintenance and by enforcing operational strategies and driving behaviors that maximize efficiency. In cooperation with Converse County, the EPC Contractor(s) will implement speed limits to ensure that fugitive dust generated by O&M vehicles traveling on the two Projects' access roads and county roads will be minimal. As a result, air quality impacts during operations will be minimal and will not result in any substantial impairment to the health, safety, or welfare of the present or expected inhabitants in the area of site influence.

7.2.3 Noise

The following mitigation measures will be implemented to reduce noise and the potential for annoyance from the two Projects' construction-related activities (even though no impacts to residents are anticipated):

- For PWP I there is a minimum distance of 0.9 mile between a WTG and the nearest non-participating landowner structure; for PWP II the minimum distance between a WTG and nearest non-participating landowner structure is 2.0 miles.
- Construction and hauling equipment will be maintained adequately and equipped with appropriate mufflers

- Noisy construction activities that might result in legitimate complaints, such as pile driving (if required), will be limited to daylight hours.
- Stationary construction equipment (such as air compressors, concrete batch plant, generators, etc.) will be located away from residences to minimize noise impacts.

7.2.4 Soils and Geologic Hazards

Erosion control and reporting measures will be prescribed in the Wyoming Pollutant Discharge Elimination System (WYPDES) construction storm water permit and administered through construction specifications and General Contractor(s) implementation. Additional proposed mitigation measures are discussed in Section 7.2.5 Surface Water and Groundwater.

Plans for avoiding and minimizing potential impacts to soils and geologic hazards could include, but are not limited to, the following:

- Site-specific erosion control measures will be monitored for effectiveness to minimize the impacts to soils during and after construction. On completion of the construction activities, all work areas, except any permanent access roads, will be regraded so that all surfaces drain naturally, blend with the natural terrain, and are left in condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion. Revegetation will be implemented for all areas temporarily disturbed by construction of the facility.
- Construction zones and areas to be disturbed will be well-defined, limited in extent, and managed by onsite inspectors and construction managers.
- Dust generation will be minimized or eliminated by using a combination of commonly employed fugitive dust management practices for various construction-related dust sources. These include covering the ground with fabric or other materials, using dust suppressants (chemical flocculating agents), minimizing disrupted surfaces areas, reducing speeds, and spraying water.
- Erosion control measures will be inspected periodically and as required after precipitation events. Erosion control measures will be repaired or replaced as necessary.
- Berms and water channeling measures may be used to direct storm water runoff to appropriate detention ponds, where appropriate.

- Barriers and other measures including hay bales, silt fences, and straw mulches will be used to minimize and control erosion where necessary.
- Side slopes created by grading will not exceed the soil strength limits, as prescribed by the final road design and turbine layout engineering design. Potentially unstable areas will be identified and avoided. Temporary evacuations greater than 4 feet deep will be sloped or stabilized with trench boxes, in accordance with OSHA and other standards.
- Mitigation for rapid erosion and gullying will include installing erosion protection structures such as rip-rap and gabions in areas identified to be potentially subject to rapid erosion, placing properly-sized and located culverts at drainage crossings, and avoiding placement of structures or roads in areas that are susceptible to rapid erosion or gullying.
- Seismic design issues will be fully addressed during final design site characterization of the Projects. The seismic site class according to the International Building Code (IBC) will be determined during subsequent geotechnical investigations. The facilities and turbine foundation will be designed for maximum considered earthquake (2,500 year return period) according to seismic hazards maps in the IBC.
- Claystone and shale bedrock layers with swelling potential will be identified at each turbine location during final design geotechnical investigations. Swelling clay layers will be mitigated by over-excavating below the bottom of the foundations and replacing with structural fill, ensuring proper drainage during construction, and also using spread footings with impermeable backfill to prevent future water introduction and associated soil swelling.
- Areas of soils with collapsing or settling potential will be identified at each turbine location during final design geotechnical investigations. These soils will be mitigated by either over-excavating the soils and replacing with structural fill, or placing the foundations deeper on a stable bearing layer.
- Soils with corrosion potential will be identified during final design geotechnical investigations. Corrosion protection will be designed by a corrosion engineer during the final design phase of the Projects. Mitigation for potentially corrosive soils could include using proper sulfate-resistant cement for foundations, and cathodic protection for buried pipes and conduits.
- Access roads will be designed based on soil properties and the requirements of the American Association of State Highways and Transportations Officials (AASHTO) for design of aggregate surfaced roadways. The thickness of the roadway section will be

determined based on the strength properties of the underlying soils, traffic duration, and traffic frequency. During the final design geotechnical investigation, the soil strength and pavement section will be designed accordingly to support the anticipated traffic loads.

- If loose sandy soil or swelling clays are present at crane pad locations, soil improvements will include reworking and compacting on-site soils to an appropriate depth and adding structural fill to increase the bearing pressure of the subgrade to support the anticipated crane loads.

7.2.5 Surface Water and Groundwater

As indicated in Table 3-5 and discussed in Section 6.6, state and federal laws and regulations require that a stormwater pollution prevention plan (SWPPP) be prepared for construction projects that disturb more than five acres. The SWPPP prepared for the proposed Projects will focus on sedimentation and erosion controls during construction and will set forth a schedule for regular inspections of appropriate controls at the construction site.

The following BMPs will be implemented to avoid and minimize impacts on surface water and groundwater resources that could occur during construction of the proposed Projects:

- Project parking and laydown areas and the concrete batch plant will not be located within 500 feet of perennial streams
- Construction activities shall be performed using methods that prevent entrance or accidental spillage of solid matter, contaminated debris, and other objectionable pollutants and wastes into flowing streams, ephemeral drainages, ponds, and underground water sources. Such pollutants include, but are not limited to, refuse, garbage, concrete (including cement and other associated chemical admixtures), sanitary waste, industrial waste, radioactive substances, oil and other petroleum products, tailings from aggregate processing, mineral salts, and thermal pollutants. Specific prevention protocols and procedures will be detailed in the Projects' SWPPP
- Borrow pits shall be excavated so that water will not collect and stand therein. Before being abandoned, the sides of the borrow pits shall be brought to stable slopes, with slope intersections shaped to carry the natural contour of adjacent, undisturbed terrain into the pit or borrow area giving a natural appearance

- Waste piles will be shaped to provide a natural appearance. Dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or water courses shall not be performed without prior approval by the applicable permitting agency and landowner
- Excavated material or other construction materials will not be stockpiled or deposited near or on stream banks, pond shorelines, or other water course perimeters where they can be washed away by high water or storm runoff or can, in any way, encroach upon the actual water source
- Turbidity control methods such as settling ponds, gravel filter entrapment dikes, approved flocculating processes that are not harmful to fish, recirculation systems for washing aggregates, or other approved methods shall be used to treat waste waters from construction operations before they enter the streams, water courses, or other surface waters. Any such wastewaters discharged into surface waters shall be essentially free of sediments and other pollutant matter.

7.2.6 Jurisdictional Wetlands and Other Waters of the United States

Project facilities will be micro-sited during the final design phase to avoid and minimize potential impacts to jurisdictional wetlands and other waters of the U.S. For unavoidable impacts, such as improvements to existing road crossings and creation of new road crossings of jurisdictional waters (including ephemeral and intermittent stream channels having a defined bed and bank), appropriate state and federal permits (as identified in Table 3-3) will be obtained. As such, the Projects will be constructed in compliance with all applicable state and federal laws and regulations pertaining to the placement of dredged or fill materials in jurisdictional waters. Compliance with these statutes requires avoidance and minimization of impacts and may require compensatory mitigation for unavoidable impacts. The design of new and improved stream crossings and any required mitigation will be detailed during the appropriate permit process(es) prior to initiating construction.

7.2.7 Vegetation and Topsoil

PWP I, LLC and PWP II, LLC and its contactors will exercise care to preserve the natural landscape and will conduct construction activities in a way that prevents any unnecessary damage to, or destruction of, natural vegetation features. The Wyoming DEQ Land Quality Division practices for topsoil handling and

revegetation are oriented towards ensuring that mining activities preserve the integrity of the topsoil by minimizing the mixing of productive topsoil with the less-productive subsoil during grading, trenching, and backfilling, thereby minimizing risk of contamination and ensuring that revegetation is effective. These measures will be employed during construction of the proposed Projects.

In temporary use areas such as parking and equipment laydown areas and the concrete batch plant site, the EPC Contractor(s) will incorporate methods to preserve topsoil by stockpiling it in discrete rows or piles along the edge of the disturbed area. Topsoil will be kept segregated from subsoil excavated from trenches or temporarily cleared areas. Following completion of construction, temporary use areas will be regraded and the stockpiled topsoil will be redistributed across the site. This will facilitate revegetation efforts by preserving the native seed bank and providing more fertile soils for additional reseeding and planting efforts.

Following completion of construction activities all work areas, except any permanent access roads, shall be graded so that surfaces drain naturally, blend with natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion. The methods described below are recommended for all areas of temporary ground disturbances throughout the two Project areas.

Preliminary seed mixes specific to the existing vegetation types in the project sites have been developed (Appendix C). These seed mixes will be used to effectively revegetate all temporarily disturbed areas within the project sites and each respective landowner will have the final authority on the implemented seed mixture.

Seeding and mulching will be completed using standard commercial practices appropriate for the soil and terrain being restored. Temporary and permanent seeding will be done during the appropriate seasons and moisture regimes, typically in the fall or early spring. Disturbed, unseeded ground may require chemical or mechanical weed control in May or June, before weeds have a chance go to seed. In accordance with specified BMPs, erosion control measures will be implemented after seeding and may include certified weed-free straw bales, filter bags, compost blankets or other geotextiles, sediment fences, silt curtains, sediment traps, or other similar devices or impervious materials. Erosion control measures will be implemented and monitored until soils are stabilized by vegetation growth from planting and/or re-seeding.

The following measures will be implemented to reduce impacts to vegetation from construction-related activities:

- PWP I, LLC , PWP II, LLC and its contractors will exercise care to preserve the natural landscape and will conduct operations (including all construction-related activities on the Projects' designated access roads and staging areas) to prevent any unnecessary damage to, or destruction of, natural vegetation features.
- Disturbed soil surfaces will be stabilized with the appropriate native seed mixture, or the seed mixture requested by the landowner, as soon as practicable following construction. Areas of soil disturbance shall be seeded as agreed upon with the landowner.
- Landscape fabrics, cellulose, straw mulch, or other suitable erosion control materials will be used according to the manufacturer/supplier specifications for application to ensure adequate temporary erosion control.

7.2.8 Noxious and Invasive Weeds

Any ground-disturbing activities inherently increase the risk of weed introduction. These risks can best be mitigated, and will be mitigated, through timely revegetation. All temporary use areas will be regraded and reseeded in accordance with the plan described above.

To limit the introduction and spread of noxious weeds and other invasive plant species, the project sites will be monitored by O&M staff and any undesirable plants will be controlled using mechanical or chemical methods. Overall, impacts to native vegetation communities will be minimized through the use of BMPs.

7.2.9 Wildlife Resources

As described in Section 6.9, wildlife survey protocols, data analysis, and reporting have been determined in consultation with the WGFD and the USFWS. Wildlife data collected in 2010 has been used to inform the development of the preliminary site plan (Appendix A, Map A-2) such that impacts to Greater Sage-Grouse leks, high raptor use areas (including ridgelines and prey concentration areas), and aquatic habitats along Willow Creek and its tributaries are excluded from development.

WWI is also working with WGFD and Project landowners to develop a Wildlife Conservation Plan in accordance with the WGFD *Recommendations* document. A meeting between WWI, the WGFD, and

project landowners took place on December 10, 2010, at the WGFD office in Cheyenne. At this meeting, the draft Wildlife Conservation Plan was reviewed by all parties and revisions are currently being made to ensure that it complies with WGFD requirements and landowner wishes.

The Wildlife Conservation Plan is expected to be finalized in February, 2011. The plan specifies post-construction requirements for restoration and revegetation of temporary use areas, weed control, wildlife monitoring, fatality monitoring, and annual reporting. Specific mitigation for wildlife impacts, if required, will be determined in coordination with the WGFD and USFWS based on the results of post-construction monitoring.

7.2.10 Scenic Resources

The following mitigation measures will be implemented to minimize impacts to scenic resources from construction-related activities:

- PWP I, LLC, PWP II, LLC and its contractors will exercise care to preserve the natural landscape and will conduct construction operations so as to prevent any unnecessary damage to, or destruction of natural resources.
- Construction routes not required for operations and maintenance access will be restored as closely as possible to the original condition pending landowner consent. The surfaces of such construction access corridors shall be ripped, regraded, and scarified as needed to provide surface conditions that will facilitate revegetation, provide proper drainage, and prevent erosion.

7.2.11 Cultural Resources

The following measures will be used to avoid impacts to cultural resources during construction:

- The proposed site plan including both Projects (Appendix A, Map A-2), does not place any project facilities or access roads within 100 feet of cultural resources identified during the 2010 archaeological survey of the project sites. In order to ensure that these sites are not inadvertently impacted during construction, the buffered polygons around the sites will be marked on construction drawings and, where necessary, orange construction fencing will be installed around their periphery to ensure that they remain “no entry” areas during construction.

- Construction crews shall participate in environmental compliance training, including the necessity of avoiding cultural resource sites, to further increase awareness of the sites and to prevent accidental damage to known and undiscovered cultural resources.
- Should any previously unknown historic/prehistoric sites or artifacts be encountered during road clearing and excavation activities, all such activities will be immediately suspended at that location and the discovery left intact until such a time that PWP I, LLC, PWP II, LLC and the landowner, SHPO, and State Lands staff (if and as applicable) are notified and appropriate measures are taken to ensure compliance with landowner desires or state laws and regulations, as appropriate.
- Should any human remains be discovered, all land altering activities at that location will be immediately suspended and the Converse County Coroner will be immediately notified.
- If during micro-siting and final site design proposed facilities are required to be located outside of the area inventoried for cultural resources, additional archaeological surveys will be completed to ensure avoidance of sites considered unevaluated or eligible for listing on the National Register of Historic Places.

7.2.12 Land Use and Recreation

The following mitigation measures will be followed to reduce land use and recreation impacts from construction and operation-related activities:

- Hunting will continue on private land during operation of the Projects as per existing landowner agreements.
- To the extent possible, the EPC Contractor(s) will limit movement of crews, vehicles, and equipment to existing county road rights-of-way and approved access roads to ensure that property damage and disruption or normal land use and recreational activities in minimized.
- The EPC Contractor(s) shall eliminate, at the earliest opportunity, all construction ruts that are hazardous to agricultural or ranching operations and/or movement of vehicles and equipment. Any ruts will be leveled, filled, and graded or otherwise eliminated in an approved manner. Damage to ditches, tile drains, culverts, terraces, local roads, and other similar land use features shall be restored as nearly as practicable to the original condition.

7.3 MONITORING PROGRAMS

7.3.1 Avian and Bat Fatality

In addition to the wildlife mitigation and avoidance measures described above, monitoring studies will be implemented during the first three years of Project operations to estimate the annual avian and bat fatalities attributable to collisions with WTGs. This information will be used to determine whether estimated fatality levels for the Project are high, moderate, or low compared to other regional wind energy facilities. As indicated above, this data will be used to determine, in consultation with the WGFD and USFWS, whether additional operational or compensatory mitigation is required. The monitoring approach will be detailed in the Wildlife Conservation Plan currently being prepared for the Projects in coordination with WGFD and Project landowners and in accordance with the WGFD Recommendations document. Monitoring protocols will conform to industry standards.

7.3.2 Greater Sage-Grouse Lek Monitoring

The Projects are located outside of any state-designated sage-grouse core areas. Nonetheless, WWI will continue to complete lek counts at the three leks located within the study area boundary. Lek count results will be provided to the WGFD on an annual basis each spring following completion of the counts.

7.3.3 Raptor Nest Monitoring

WWI will continue to monitor the raptor nests identified during pre-construction aerial and ground-based raptor nest surveys of the study area. Any new nests identified within the course of post-construction monitoring will be documented as will the status of previously documented nests. Raptor nest monitoring will be completed between late April and early July each year for three years following commencement of Project operations.

7.3.4 Aquatic Monitoring

As described in Section 6.4.4, SWCA completed a reconnaissance level assessment (RLA) of aquatic habitats within the study area in accordance with WGFD Recommendations during the summer of 2010. The RLA determined that two of the sub-watersheds in which the Projects are located are currently considered “at-risk” for erosion and sedimentation of stream channels and aquatic habitats. This

designation is largely due to poorly designed and degraded stream crossings along Mormon Canyon Road.

Prior to construction, the existing culverts at these crossings will be reset or redesigned and replaced in order to improve stream flows and minimize erosion and sedimentation. PWP I, LLC, PWP II, LLC and its EPC Contractor(s) will conduct a pre-construction onsite visit and yearly post-construction onsite visits with the WGFD and DEQ personnel to ensure that the redesigned culverts are functioning properly and the BMPs outlined in the SWPPP are working as designed. As per the WGFD *Recommendations*, if any problems are observed, the WGFD will provide recommendations to fix the problems. If the problems are not fixed in a timely manner, the WGFD may recommend that additional monitoring be conducted.

7.3.5 Technical Advisory Committee Review

A Technical Advisory Committee (TAC) will review the monitoring protocols described above and contained in the Wildlife Conservation Plan, assess monitoring results, and prepare recommendations for PWP I LLC and PWP II, LLC during the Projects' first three years of operation. The TAC will be composed of representatives from WDEQ – Industrial Siting Division, the WGFD, U.S. Fish and Wildlife Service (USFWS), and resource specialists or representatives designated by PWP I, LLC and PWP II, LLC.

7.3.6 Employee Orientation Program

Construction workforce members will attend a new employee orientation program, in which they are provided information to enhance wildlife awareness, minimize impacts to natural and cultural resources, and understand their respective roles in ensuring compliance with the two Projects' permit conditions and commitments.

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APPENDIX A:

PROJECT LOCATION, SITE PLAN, AND LAND OWNERSHIP

APPENDIX B:

MINERAL RIGHTS OWNERSHIP

APPENDIX C:

RECLAMATION SEED MIXES

APPENDIX D:

PUBLIC INVOLVEMENT

Exhibit D-1: *PWP I and PWP II Fact Sheet (Updated November 2010)*
Exhibit D-2: *Example of Certified Letter to Local Government Bodies*
Exhibit D-3: *List of Contacts to Whom we Sent Certified Project Notifications*
Exhibit D-4: *Letter from Town of Glenrock to WWI and Response Letter from WWI to Town of Glenrock*
Exhibit D-5: *Letter from WGFD Dated December 2, 2010, in Response to Certified Mailing to State Agencies*
Exhibit D-6: *Letter from Casper Area Chamber of Commerce to PWP*
Exhibit D-7: *Letter from Converse Area New Economic Development Organization*
Exhibit D-8: *Letter from Renewable Energy Alliance of Landowners in Support of WWI*
Exhibit D-9: *Invitation to NLRA Dated November 4 to Attend Glenrock Open House on November 9, 2010*
Exhibit D-10: *PWP I and PWP II October 2010 Educational Brochure Mailer with Reply Card*
Exhibit D-11: *PWP Press Releases Issued During Development Process*
Exhibit D-12: *Pioneerwindpark.com - Screen shot*
Exhibit D-13: *Postcard Mailer Invitation to PWP I and PWP II Open House*
Exhibit D-14: *Print Advertisement for PWP I and PWP II Open House*
Exhibit D-15: *WWI Thank You Ad Following Open House*

APPENDIX E:

HOUSING AVAILABILITY

APPENDIX F:

RESOURCE MAPS

F-1. Noise
F-2. Bedrock Geology
F-3. Surficial Geology
F-4. Paleontology
F-5. Soils
F-6. Surface Water and Wetlands
F-7. Groundwater
F-8. Vegetation
F-9. Wildlife
F-10. Cultural Resources Inventory Area
F-11. Recreational Resources

APPENDIX G:

CITY OF GLENROCK WATER SUPPLY

APPENDIX H:

WILDLIFE REPORT AND RECONNAISSANCE-LEVEL ASSESSMENT

(Includes related correspondence from WGFD)

APPENDIX I:

CULTURAL RESOURCES CLASS III INVENTORY

APPENDIX J:

LIST OF PREPARERS